Mindful Moments in the ICU:

Evaluating an Asynchronous, Online Mindfulness Program in Critical Care Nurses during the COVID-19 Pandemic

Heidi T. Mock

A DNP Final Project submitted to the faculty of Radford University in partial fulfillment of the requirements for the degree of Doctor of Nursing Practice in the School of Nursing

July 2021

Committee: Dr. Wendy Downey, Dr. Charles Bullins, & Dr. Christine Fish-Huson

Dr. Wendy Downey, chair	8/27/2021 Date
Dr. Charles Bullins	8-27-2021 Date
Dr. Christine Fish-Huson	8·27·2021 Date

Abstract

Introduction: Low professional quality of life (pro-QOL) can lead to poorer patient outcomes and increased costs for healthcare systems. In-person mindfulness-based interventions can be effective in improving pro-QOL, but alternative delivery methods, including asynchronous and web-based deliveries, remain undertested in nursing populations at this time.

Methods: This pretest/posttest quasi-experimental program evaluation project, set in a suburban, Level I medical center in Central Virginia, utilized a mindfulness app, eMLife, for ICU nurses to practice mindfulness for 15 minutes per day, 6 days per week for 4 weeks. Participants completed the Five Facets Mindfulness Questionnaire and Professional Quality of Life Scale before and after the program to assess for changes in mindfulness and pro-QOL. A follow-up survey was sent to all ICU nurses to assess mindfulness knowledge, attitudes, skills, and barriers.

Results: None of the 17 participants reported high levels of burnout (BO) or secondary traumatic stress (STS), and none reported low levels of compassion satisfaction (CS). Instead, 35% reported high levels of CS, 29% reported low levels of BO, and 35% reported low levels of STS. Nearly 90% of the 116 respondents had heard of mindfulness practice, but it seems that many know of it for stress relief. Nearly 57% of nurses do not practice mindfulness, and the most commonly cited barriers (n = 63) were forgetting (n = 32), not knowing how (n = 29), and not having enough time (n = 23).

Conclusion: Although this program was unable to effectively evaluate pro-QOL using eMLife, the survey responses suggest that offering a free mindfulness program may not be sufficient to promote pro-QOL.

Keywords: mindfulness, Professional Quality of Life Scale, Five Facets Mindfulness Questionnaire, burnout, critical care nurse, COVID-19

Dedications

To my family: my parents, Dan and Jenny; my sister and roommate, Dori; as well as Allison, Jason, and Audrey Breeding; Amy, DeWayne, Samuel, and John Moore; and Joey, Ashley, Cate, Callie, Will, Jack, and Tommy Mock for encouraging and supporting me through this journey.

To my MICU family, and to all critical care nurses at UVA Health: thank you for your selfless dedication to provide exceptional care during this pandemic. Not many people know what you went through, what you gave up, and what you lost during this time, and no one can pay you back for that sacrifice, but I hope this small effort to help support you adds to the body of work that ultimately transforms the healthcare system into a place that lives out its valuing of you every day.

Acknowledgements

Dr. Wendy Downey, for guiding me through this process and encouraging me every step of the way. I quite literally could not have done this without you.

My committee, Dr. Charles Bullins and Dr. Christine Fish-Huson, for providing valuable feedback during critical steps in this process.

Dr. Richard Carpenter, Dr. Sharon Bragg, and Kris Blackstone, managers of the MICU, for supporting my efforts and encouraging me in this journey.

Table of Contents

List of Tables

List of Figures

Mindful Moments in the ICU: Evaluating an Asynchronous, Online Mindfulness Program in Critical Care Nurses during the COVID-19 Pandemic

Chapter 1: Introduction

An emerging phenomenon observed in nursing is that of a decreased professional quality of life (pro-QOL; note that the abbreviation *pro-QOL* refers to the general phrase "professional quality of life."). Pro-QOL, in health care, encompasses concepts such as burnout, occupational stress, secondary trauma, compassion fatigue, and moral distress (Stamm, 2010). These negative concepts have significant impacts for nurses, their patients, and their employers. Todaro-Franceschi (2013) stated that "overall quality of care, clinical outcomes, and patient satisfaction are directly related to the workplace environment" (p. 25).

Low pro-QOL in nursing has been linked to lower patient satisfaction scores and poorer patient outcomes including increased infection rates, decreased patient and family communication, increased rates of 30-day morbidity and mortality, and increased medication errors (Brown et al., 2018, p. 349; Browning, 2019, p. 533). These poor patient outcomes and low patient satisfaction scores now cost health care systems money due to Medicare's value-based purchasing system of reimbursement (United States Centers for Medicare and Medicaid Services, n.d.).

Low pro-QOL also costs health systems money in decreased organizational loyalty, increased turnover, absenteeism, and presenteeism (Brown et al., 2018, p. 349; Cann & Mullaney, 2019, p. 225; Rushton et al., 2015, p. 413). Presenteeism is the phenomenon in which employees report to work but are unfit to do so for physical, mental, or emotional reasons (Cann & Mullaney, 2019, p. 225). It is estimated that presenteeism from just back pain and depression costs around $12 billion annually (Cann & Mullaney, 2019, pp. 225-226). Additionally,

presenteeism causes increased employee distraction, which, in a health care setting, can lead to staff or patient harm (p. 225). In 2018, nurses and nursing assistants made up 6.4% of all workers compensation claims, 2.7% and 3.7% respectively (Insurance Information Institute, 2018). This ranks them fourth and eighth out of all industries, which is higher than construction workers (Insurance Information Institute, 2018).

The symptoms of low pro-QOL can significantly impact nurses' personal quality of life. In addition to the psychological impacts of a low pro-QOL such as lethargy, difficulty sleeping, emotional instability, cynicism, alcoholism, substance use disorders, and eating disorders, there are physical health implications (Browning, 2019, pp. 532-533). High stress situations are perceived by the brain and translated to the body by activating the sympathetic nervous system (Ganz, 2012, p. 26). This response is adaptive in the short-term, but it can cause health problems when stress becomes chronic. During a stressful event, the sympathetic nervous system activates, elevating blood sugar levels, heart rate, blood pressure, and other neuroendocrine functions (Ganz, 2012, pp. 22-26). When left chronically elevated, these changes cause long-term damage to the body and can result in obesity, cardiovascular disease, type 2 diabetes mellitus, cancer, and a higher susceptibility to infectious diseases (Ganz, 2012, p. 29; Kelley, 2020, p. 75). These health impacts of low pro-QOL further exacerbate the cycle of nursing shortages and low pro-QOL.

Over the past 1.5 years, the COVID-19 pandemic has added additional complexity to the problem of low nursing pro-QOL. COVID-19 caused hospitals to significantly reduce budgets, resulting in an increased workload for nurses. Furthermore, social distancing requirements resulted in many nurses losing stress reduction and coping techniques, such as participating in group fitness, going out to dinner with friends, or going on vacation with family. The COVID-19

pandemic also exposed many people to the capabilities of electronically-delivered services—everything from live theater to wine tastings were being offered virtually. As hospitals made difficult choices regarding limited funds during the pandemic, nursing pro-QOL may have suffered. Now in a post-pandemic era, cost-effective interventions must be implemented to improve nursing pro-QOL to break this cycle and improve the health of nurses and their patients. It is also worth investigating if these interventions can be delivered electronically, or if they are better delivered in the traditional, in-person format.

Project Purpose and Investigation Questions

The purpose of this project is to assess the effectiveness of an entirely asynchronous, web-based mindfulness program, eMLife. The PICOT question for this project is as follows: In adult intensive care unit (ICU) nurses, does participating in an asynchronous, web-based mindfulness program improve mindfulness and professional quality of life scores over the course of 4 weeks? The independent variable is participation in eMLife, as measured by total minutes spent in eMLife and total sessions completed. The dependent variables are mindfulness and pro-QOL.

The questions this program will attempt to answer are as follows:

1. Does participation in eMLife impact mindfulness, as measured by the Five Facets Mindfulness Questionnaire (FFMQ)? The null hypothesis (H_0) is that participation will not alter mindfulness. The hypothesis (H_1) is that increased participation in eMLife will improve mindfulness.
2. Does participation in eMLife impact nursing pro-QOL, as measured by the Professional Quality of Life Scale (ProQOL-5; Note: the abbreviation *ProQOL-5* refers to the tool used to measure professional quality of life)? The null hypothesis

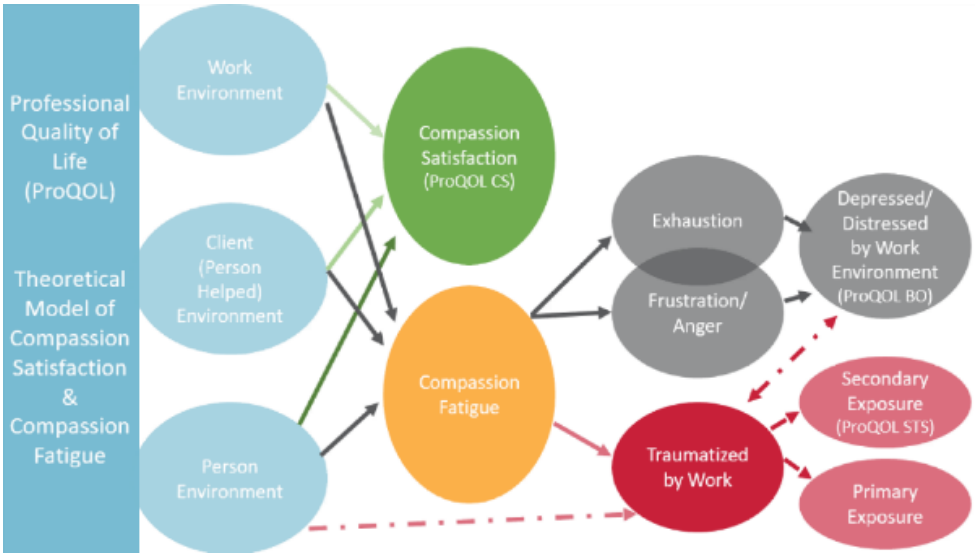
(H_0) is that participation will not impact ProQOL-5 scores. The hypothesis (H_1) is that increased participation in eMLife will improve ProQOL-5 scores.

Conceptual Framework

This project was guided by the Professional Quality of Life Model (ProQOL; Note: the abbreviation *ProQOL* refers specifically to the Professional Quality of Life Model), depicted in Figure 1. The ProQOL Model was first published in the late 1990s by psychologist Beth Stamm (Stamm, 2010, p. 12). It evolved from Figley's work in the 1980s that resulted in the Compassion Fatigue Self-Test (Stamm, 2010, p. 12). Stamm and Figley worked together to add compassion satisfaction, which resulted in the Compassion Satisfaction and Fatigue Test (Stamm, 2010, p. 12). Finally, Stamm added the domain of trauma and published it as the ProQOL Scale (Stamm, 2010, p. 12). The ProQOL Model succinctly demonstrates how the various concepts related to pro-QOL interact. When considering the potential interventions applied to improve the pro-QOL of nurses, this model helps sort the interventions by type. They are often either targeted at the work environment, the helper, or both. Each of the concepts in the ProQOL Model are well developed and well researched, and it is necessary to understand each before reviewing the research literature related to the ProQOL Model. These concepts, with the addition of resilience, are discussed in the following sections.

Figure 1

Professional Quality of Life Model



Note. Image obtained from Stamm, 2010, p. 10.

Compassion Satisfaction

Compassion satisfaction (CS) is a positive attribute in ProQOL that "is derived from doing caring work and readily manifests itself as happiness, or at the very least, contentment in the workplace" (Todaro-Franceschi, 2013, p. 4). Nurses with CS find their work meaningful and do it with full heart (p. 4). The word compassion is derived from Latin, meaning to co-suffer, so it takes a considerable amount of energy and resources to support nurses finding satisfaction, instead of fatigue, from compassion (p. 32). CS stems from purposeful action. Todaro-Franceschi (2013) stated that happiness is the conscious pursuit of goals (p. 35). Thus, CS is the result of conscious effort on the part of both the nurse and the employer.

Compassion Fatigue

Compassion fatigue is the relational toll that results from "caring for those who are suffering from any kind of physical or mental anguish or trauma" and internalizing that suffering (Todaro-Franceschi, 2013, pp. 5 & 76). Todaro-Franceschi (2013) called nurses suffering from this phenomenon "heavy-hearted" (p. 5). Critical care nurses, who do not often see patients return to their former state of wellness, are at an especially high risk of compassion fatigue (p. 76). Furthermore, critical care nurses often experience death overload, which contributes to compassion fatigue. Death overload is a form of traumatic stress that occurs when a person experiences "the death of too many patients in a short period or hav[e] worked with a patient for too long a time prior to the person dying" (Todaro-Franceschi, 2013, p. 82)

Burnout

Burnout (BO), while similar to compassion fatigue, is distinctly different in that it is derived from dissatisfaction, not from relationships (Todaro-Franceschi, 2013, p. 5). It is more generally due to "workload, environment, salary, benefits, [and] organizational culture... Burnout

develops gradually over time with prolonged emotional and physical exhaustion, and it ultimately results in widespread apathy, a disinterest in work and relationships" (Todaro-Franceschi, 2013, p. 5).

BO syndrome was first described by Freudenberger in 1974 based on his personal experiences working with challenging patient populations (Browning, 2019, p. 528). Freudenberger's work was picked up by Maslach and Jackson, who published the Maslach Burnout Inventory in 1981 (p. 528). They conceptualized BO as a phenomenon comprised of three domains: emotional exhaustion, depersonalization, and reduced personal accomplishment (p. 529). Emotional exhaustion can be defined as "generalized fatigue that can be related to devoting excessive time and effort to a task or project that is not perceived to be beneficial" (Moss et al., 2016, p. 368). Depersonalization is defined as a "distant or indifferent attitude towards work [that] manifests as negative, callus, and cynical behaviors or interactions with colleagues or patients in an impersonal manner" (p. 370). Reduced personal accomplishment is defined as "the tendency to negatively evaluate the worth of one's work, feeling insufficient regarding the ability to perform one's job, and a general poor professional self-esteem" (p. 370).

It is estimated that 25-33% of critical care nurses have severe BO, with 86% having at least one of the three symptoms, although study results range from a 0-80% incidence rate (Browning, 2019, p. 532; Moss et al., 2016, p. 370). The most commonly seen symptom of BO in critical care nurses is emotional exhaustion, at 74%, followed by personal accomplishment, at 60%, and finally depersonalization, with 48% of nurses exhibiting symptoms (Moss et al., 2016, p. 370). Critical care nurses are exposed to numerous risk factors that make them more prone to BO than both other nurses and the general public. A diagram of those risk factors is displayed in Figure 2. Additional risk factors for BO include being self-critical, idealistic, perfectionist, or

overcommitted; young aged; and having an inadequate support system outside of work, including having no spouse or children (Moss et al., 2016, p. 371).

Figure 2

Risk Factors for Burnout Syndrome

Note. Figure obtained from Browning, 2019, p. 532.

Rushton et al. (2015) reported that emotional exhaustion seems to have the highest predictive validity for BO in ICU nurses (p. 417). This has both concerning and encouraging implications on the trajectory of BO rates. The COVID-19 pandemic has put greater emotional burdens on critical care nurses, as visitors were forced out of hospitals and nurses picked up the responsibility of being their patient's only source of human interaction. Rushton et al.'s (2015) findings are concerning, then, as this may mean that rates of BO may be rapidly increasing. It is encouraging, however, because there are interventions that may be effective at improving emotional exhaustion, and they may be more effective now than ever. A greater discussion of those possible interventions is discussed in the following chapter.

Moral Distress

Moral distress is frequently described as when "the person is aware of a moral problem, acknowledges moral responsibility, and makes a moral judgement about the correct action; yet, as a result of real or perceived constraints, participates in perceived moral wrongdoing" (Rushton et al., 2014, p. 413). Moral distress is frequently seen in the critical care setting where staff are often exposed to uncertainty, futility, and the end-of-life. Dacar et al. (2019) noted that complex technological demands, from the electronic health record to advanced monitoring and machinery seen in the ICU, combined with low autonomy and control, derived from protocol- and order-driven practice, put ICU nurses at further risk for moral distress (p. 72). Between 13 and 25% of nurses in the ICU have left their position over moral distress, while 5% left the field of nursing entirely (Rushton et al., 2014, p. 413).

Trauma

There are three types of trauma commonly seen in nurses—primary trauma, secondary trauma, and post-trauma (Todaro-Franceschi, 2013, p. 76). Primary trauma is that which the

nurse experiences personally, such as a physically violent act from a patient or bullying from coworkers or managers (p. 77). Secondary trauma is an occupational hazard stemming from knowing and caring for people undergoing traumatic events (Kelly, 2020, p. 74). Death overload and moral distress, discussed previously, are forms of secondary trauma (Todaro-Franceschi, 2013, p. 82). Secondary trauma cannot be avoided in the nursing profession; it is inherent in the role. Nurses need training to respond properly to it.

Collective trauma is a type of post-trauma that occurs "when a group of people are traumatized at the same time by the same thing" (Todaro-Franceschi, 2013, p. 153). The COVID-19 pandemic is one such type of collective trauma, shared both by the world and, more specifically, nurses caring for COVID-19 patients. Collective trauma has been linked to demoralization and loss of communality, both of which can lead to decreased pro-QOL if seen in nursing (Todaro-Franceschi, 2013, p. 154).

Post-traumatic stress disorder (PTSD) occurs "as a response to feelings of fear, helplessness, and horror from a traumatizing event that can be either primary or secondary in nature" (Todaro-Franceschi, 2013, p. 156). PTSD, unlike the concepts discussed up to this point, is a clinical diagnosis and is characterized by reliving the traumatic event, avoiding reminders of it, and experiencing a hyperarousal to memories of the event for at least a month after its occurrence (Todaro-Franceschi, 2013, p. 156). In a survey of 332 nurses, 22% had symptoms of PTSD, while 18% met diagnostic criteria of PTSD (Mealer et al., 2009, p. 1121). Outpatient nurses in that study had significantly lower (p = .006) rates of PTSD than inpatient nurses (Mealer et al., 2009, p. 1121). In a study by Mealer et al. (2009), 23% (n = 98) of ICU nurses met PTSD diagnostic criteria; in another study by Mealer et al. (2014), 44% (n = 27) of ICU nurses met diagnostic criteria for PTSD (Mealer et al., 2009, p. 1121; Mealer et al., 2014, p. e101).

Among ICU nurses, medical ICU nurses are the most likely to experience PTSD (Mealer et al., 2017, p. 189).

After the terrorist attacks on September 11, 2001, nearly 50% of Americans exhibited symptoms of PTSD (Todaro-Franceschi, 2013, p. 153). While it is too soon for such data to be collected and reported for the COVID-19 pandemic, it could be expected that there will be similar increases in PTSD in the general public and in the field of critical care nursing.

Resilience

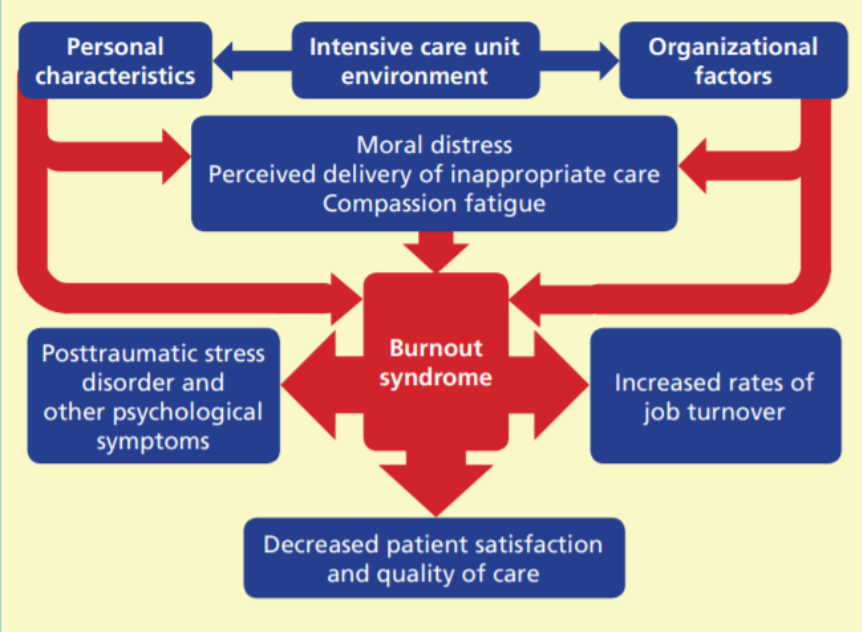
In its most literal definition, resilience is "the capability of a strained body to recover its size and shape after deformation caused especially by compressive stress" (Merriam-Webster, n.d.). In its application to psychology and the social sciences, "[r]esilience is a concept where people are encouraged to re-frame negative experiences or stressors so that they become a fundamental occasion for personal growth" (Best, 2019, p. 400). It is also "an individual's ability to overcome an adverse situation with optimism and self-control" by using both internal and external coping strategies (Brown et al., 2018, p. 349). Resiliency is a positive and protective trait that is essential to a nurse's success (Best, 2019, p. 400; Rushton et al., 2015, p. 413). Resilient nurses are more likely to have traits of optimism, self-efficacy, hope, flexibility, resetting, problem solving, and critical thinking (Brown et al., 2018, pp. 350-352). Resiliency appears to increase with increased experience, but it is possible that only resilient nurses are able to stay in the field long enough to have high experience (Brown et al., 2018, p. 352). Resilience, while not mentioned in the ProQOL Model, likely plays a role in protecting against compassion fatigue.

Summary

In summary, nursing pro-QOL is comprised of the negative forces of compassion fatigue, BO, moral distress, and trauma and the positive forces of CS and resiliency. A model—attempting to associate these factors—in the specific context of critical care, is displayed in Figure 3. It links the concepts with organizational factors as both inputs and outputs, establishing the cyclical nature of pro-QOL. This cyclical process necessitates innovation and intervention in order to change the landscape of low nursing pro-QOL.

Figure 3

Interactions of Nursing Quality of Life Domains in the ICU Environment



Note. Figure obtained from Moss et al., 2016, p. 371.

Chapter 2: Integrated Literature Review

The literature review for this project was completed in May 2020 through Radford University's (RU) "SuperSearch" database, which uses keywords to search over 220 databases (RU, n.d.). Articles written in the English language that were peer reviewed between the years of 2000 to 2020 were included. Studies pertaining to nursing students, ambulatory or outpatient nurses, or exclusively physicians were excluded. One study regarding exclusively physicians was included due to its large sample size, multi-group randomization, and similar delivery style to this program. Studies utilizing aromatherapy as an intervention were also excluded, due to the common hospital policy prohibiting strong scents. Search terms included stress reduction, nurses, ICU or critical care, mindfulness, resiliency, and BO. Over 8,600 articles resulted, 230 full-text articles read, and 40 full-text articles were included in the literature review.

The target of interventions to improve pro-QOL generally fall into one of the three domains of the ProQOL Model: the workplace, the client, or the caregiver (carer). Moss et al. (2016) suggested workplace modifications such as self-scheduling, limiting consecutive shifts, and promoting a healthy workplace (p. 373). Modifications on the client include early palliative care and ethics consults, early goals of care conversations, and early family care meetings (p. 373). Finally, interventions targeted at the caregiver include stress reduction training, relaxation techniques, and meditation (p. 373). This program recognizes the limitations the workplace is faced with during the COVID-19 pandemic; similarly, the unknowns about caring for a COVID-19 patient limited the ability to intervene on them. Thus, the interventions explored in the following sections all pertain to the caregiver, the nurse.

Mindfulness-Based Interventions

Alkhawaldeh et al. (2020), in their systematic review of stress management interventions for ICU nurses, reviewed 12 studies with experimental or quasi-experimental designs and an outcome of stress. They found that both cognitive-behavioral skills training and mindfulness-based interventions (MBI) were effective at reducing stress in ICU nurses. Ghawadra et al. (2019) further explored the efficacy of MBI but included studies looking at all nurses. Six of the nine studies saw reductions in stress, three saw reductions in anxiety and depression, six saw reductions in BO, and four saw improvements in mindfulness (Ghawadra et al., 2019).

Mindfulness-Based Stress Reduction (MBSR) is a formal program first developed by Kabat-Zinn in 1990 (Ghawadra et al., 2019, p. 3754). The program, in its original form, is 8 week course, consisting of a 2.5 hour synchronous weekly meeting, a 6 hour daylong retreat between weeks 6 and 7, and 20 minutes of daily practice to be completed 6 days per week (Cohen-Katz et al., 2004, p. 303). Of the 40 intervention articles reviewed, only three utilized the MBSR program as originally published (Cohen-Katz et al., 2004; Daigle et al., 2018; Wang et al., 2017). Modified MBSR programs were utilized in 26 of the studies reviewed. Attrition plagued many studies utilizing MBSR. Lin et al. (2019) reported 11 out of 44 nurses in the intervention group missed more than two of the eight sessions (p. 115). Shapiro et al. (2005) reported that eight out of 18 health care professionals failed to complete the study (p. 170). Studies were mixed as to whether they provided the intervention while the nurse was “on the clock” or if the intervention was provided during off hours.

Adverse Effects of Mindfulness-Based Interventions

Adverse effects of MBI are an understudied and underreported phenomenon in the literature. Shapiro et al. (1992) was one of the first to report this phenomenon after studying 27

participants of an intensive meditation retreat, either 2 weeks or 3 months in length. Of the 27 participants, 63% (n = 17) reported experiencing at least one adverse effect (p. 64). The effects ranged from feelings of depersonalization to "increased awareness of negative qualities and emotions within [ones]self," and difficulties adjusting to the world (Shapiro et al., 1992, pp. 64-65). It is worth noting that participants reported significantly more positive than adverse effects from mindfulness (p = .002 at time 1 and p = .0215 at time 2), which included "greater happiness and joy; more positive thinking, more self-confidence; better ability to get things done (more effective); better problem solving; more accepting, compassionate, tolerant to self, and to others; more relaxed, less stressed, more resilient; better able to control feelings" (Shapiro, 1992, p. 65).

These findings were seen again by Lomas et al. (2015) in their qualitative evaluation of 30 men practicing meditation in the community. They reported adverse effects such as difficulties learning meditation, a troubled sense of self, exacerbation of psychological issues, and a challenge to reality (Lomas et al., 2015). On the positive, though, participants valued mindful meditative practices as beneficial because it "equipp[ed] them with coping skills and generat[ed] positive experiences" (Lomas et al., 2015).

Lustyk et al. (2009), in their recommendation report for mindfulness research safety practices, presented a table of 12 case report and case study articles inventorying the adverse effects of mindfulness practice. Adverse effects ranged from anxiety and pain to a lowered seizure threshold, psychosis, and suicidality (pp. 22-23). Lustyk et al. (2009) added the clarification that many of the adverse effects of meditation are seen after intensive retreats that also include "sensory deprivation, loss of sleep, and fasting, all of which may serve as precipitants for a psychotic episode" (p. 28). This was the case for Shapiro (1992), but the participants in Lomas et al. (2015) were community practitioners. While they were community

practitioners, 10 of the 30 participants were intensely involved, either living or working regularly at the mindfulness center (Lomas et al., 2015, p. 850). It appears that the evidence is circumstantial, but Lustyk et al. (2009) recommended a consideration of adverse effects when planning and implementing MBI.

Electronic Delivery of Mindfulness-Based Interventions

MBSR, in its original form, is difficult to implement in an ICU. With 65% of nurses working 12 hours shifts, the program cannot be offered before or after a shift. Arranging for coverage in the midst of the shift for a 2.5 hour class is also difficult, as well as potentially dangerous for the patient (Stimpfel et al., 2012, p. 2505). Approximately 50% of adverse events are due to communication failures; the benefits of a synchronous MBSR program likely do not outweigh the risks of increasing handovers of care (Manias et al., 2015, p. 81). Additionally, many smaller or more rural healthcare facilities may not have access to a trained mindfulness facilitator, making traditional implementation impossible.

Furthermore, the healthcare system, in the midst of and following COVID-19, will have barriers to implementing MBSR in its original form. There will likely be little budget to accommodate the eight weekly 2.5 hour classes and 6 hour retreat led by a certified instructor. Nurses may also be under strain, working more hours with fewer staff members. Finally, it is not advisable for groups of people to be meeting electively in close quarters to do breathing techniques, due to potential infection risk. Five studies evaluated electronic deliveries of MBI, with varying success.

Cutshall et al. (2011) utilized an electronic biofeedback meditation program called “Healing Rhythms” to measure changes in vitality, anxiety, stress, and satisfaction. The intervention asked participants to complete a 30-minute guided meditation session, four times

per week for 4 weeks. Of the 11 nurse participants who enrolled, eight completed the study, and three dropped out due to being unable to fulfill the time commitments (p. 111). Time spent using the program was recorded, but the data was not reported. This study reported significant changes in vitality ($p = .04$), anxiety ($p = .03$ and $p = .01$), and stress ($p = .01$) (Cutshall et al., 2011, p. 111). This study was limited by its small sample size. Its attrition rate highlights the difficulty in running a mindfulness program for nurses, despite being asynchronous and electronic. Furthermore, Healing Rhythms is a costly intervention, retailing at $299 for each participant (Unyte, n.d.).

Gracia Gozalo et al. (2019) utilized the WhatsApp messaging system to send out weekly mindfulness exercises for participants to practice over the course of 8 weeks. This was followed by daily reminders to practice (p. 210). There was no measurement of compliance to the program. There were 32 participants in the intervention—27 females and 5 males. Nurses and nursing assistants accounted for 24 of the participants, with physicians accounting for the final eight (p. 212). Of the measured outcomes of BO, mindfulness, and self-compassion, there were only significant changes in self-compassion ($p = .001$) and four subscales of mindfulness (p. 214). Gracia Gozalo et al. (2019) reported significant increases in two subscales of the mindfulness tool, non-reactivity to inner experience ($p = .002$) and observation ($p = .004$) (p. 214). Meanwhile, there were significant decreases in non-judging of inner experience ($p = .035$) and acting with awareness ($p = .021$) (p. 214). Scores on the description subscale did not change (p. 214). The authors do not provide a discussion as to why these mixed results may have occurred, but perhaps it is due to the intervention. If it emphasized some domains of mindfulness more than others, it could have produced these results.

The strength of this study is that it demonstrates that mindfulness interventions can create significant change by entirely asynchronous, individual practice. The study, however, left out some details of the intervention that may have altered results. There is repeated mention throughout the article that participants were not blinded to each other's participation and that there were interactions between participants, such as question and answer time and a few group practice sessions. This may have impacted results and may limit the study's generalizability.

Medisauskaite and Kamau (2019) evaluated a computer-based education program on BO, coping with death, and resiliency on physicians in Great Britain. They measured 10 different outcomes, including BO, anxiety, psychiatric and physical symptoms, insomnia, and substance use (p. 385). The intervention group consisted of 39 doctors, while the control group consisted of 52 doctors. Participants in the intervention group saw significant improvements in emotional exhaustion ($p = .01$), depersonalization ($p = .02$) and anxiety ($p = .03$) (p. 387). This well-executed, randomized controlled trail again demonstrates promise that electronically administered interventions can be effective in improving pro-QOL.

Wright (2017) assessed the efficacy of a web-based stress reduction program in nurse midwives in the mid-Atlantic. Participants logged onto a password-protected website, the Benevolent Midwifery Project, four times per week for 4 weeks to complete training in stress reduction practices such as yoga, mindfulness, and meditation. Sessions lasted 5 to 30 minutes (p. 163). There were 13 participants enrolled in the study, but only 10 participants completed follow-up surveys. The three participants who did not complete the study cited time constraints as their reason for dropping out of the study (p. 165). There was no measurement of fidelity to intervention schedule. Due to its small sample size, power analysis was not completed, but participants reported a 25% reduction in stress and 18.6% improvement in self-efficacy (p. 186).

The final study to evaluate an electronically delivered program was Wylde et al. (2017), who compared using a smartphone-based application (app) to a modified, but traditionally delivered MBSR program in new graduate pediatric nurses. The traditional group consisted of 49 participants in the 2013 residency program, and they attended one session per week for 4 weeks in the residency classroom and were encouraged to practice a 5 minute mindfulness exercise in daily life. The smartphone-based app group consisted of 46 participants in the 2014 residency program, and they would present to the residency classroom for one session per week for 4 weeks, but they could complete self-guided mindfulness exercises through the app. Utilization of the app was not recorded due to limitations within the technology. Researchers assessed for changes in CS, compassion fatigue, BO, stress, trauma symptoms, and mindfulness (p. 208). The group utilizing the app reported significantly higher acting with awareness ($p < .01$) than the traditional group, but otherwise, the groups reported similar outcomes (p. 209). The results of this study are promising. Utilizing an app to promote mindfulness may be equally as effective, if not more effective, at producing the desired outcomes than traditional methods, in addition to being more convenient and potentially more cost-effective.

Summary

There are still many questions left to be answered, especially regarding asynchronous, electronically delivered MBI. They appear to be equally as effective as traditional delivery methods, but studies investigating them in nursing populations have struggled in several regards. A few studies struggled to recruit large enough sample sizes to do power analyses, some had no measurement of intervention fidelity, and only one was randomized. Additional investigation is needed to further understand the efficacy and utility of asynchronous, electronically delivered mindfulness interventions.

In response to this evidence, UVA Health implemented an electronically delivered mindfulness program, eMLife, that is available to all employees. This program has not undergone rigorous testing in health care workers. This program hopes to add to the literature in this field in three ways. First, the program seeks to recruit a large enough sample size to conduct power analyses. Second, the program will utilize a measurement of intervention fidelity. The app records minutes spent in eMLife, the individual sessions completed, and the date of completion. This data will be reported weekly during the program to ensure intervention fidelity. Finally, eMLife, as an asynchronous, electronically delivered mindfulness program, will be evaluated, and the outcomes of this program can be compared to those of more traditional mindfulness programs.

Chapter 3: Methods

The program plan was of a quasi-experimental, one group, pretest posttest design. Eligible participants completed a pretest before participating in 4 weeks of mindfulness practice. They were asked to participate in mindfulness 15 minutes per day, 6 days per week for the duration of the program. They logged their minutes of practice and sessions completed weekly. After 4 weeks, they were asked to complete a posttest. The mindfulness program used in this program, eMLife, was already available to all UVA Health employees, but its use was not widespread. Out of over 12,000 employees eligible for this service, only 400 employees had enrolled in eMLife from its introduction in February 2020 through June 30, 2020 (M. Fritz, personal communication, June 30, 2020; University of Virginia [UVA], n.d.). As an intervention, eMLife has not been rigorously studied in any population, and there are no published studies utilizing it as an intervention in a health care setting. The target population of this program is all critical care nurses.

Project Setting

UVA Health is a 668-bed Level 1 academic medical center in central Virginia (UVA Health, n.d.a). UVA Health employs over 2,600 nurses (UVA Health, n.d.a). Of those nurses, 72% have a baccalaureate or higher degree in nursing, and 43% of eligible nurses hold a professional certification (UVA Health System, n.d.c; UVA Health System, n.d.d). UVA Health's Professional Nursing Staff Organization launched a nursing retention program in October 2017 to address a 14.2% voluntary nurse turnover rate (UVA Health Professional Nursing Staff Organization, 2018, p. 4). In one year, they were able to reduce the voluntary turnover rate to 12.7%, which puts it below the national benchmark for nursing, 13.2% (Kurnat-Thoma et al., 2017, p. 3; UVA Health System Professional Nursing Staff Organization, 2018, p.

4). However, with cost estimates of $12,350 per nursing termination, the financial implication of a 12.7% turnover rate to UVA Health is over $4 million per year (Kurnat-Thoma et al., 2017, p. 3).

Sample

A convenience sample of adult critical care nurses at UVA Health was used for this program. There are five adult ICUs at UVA Health: Medical, Thoracic Cardiovascular, Surgical Trauma, Neurosciences, and Coronary Care. In addition to these five ICUs, there are critical care float nurses and critical care resource nurses who float to all ICUs and serve as ICU-competent nurses throughout the hospital, respectively.

Selection Criteria

A recruitment flyer was emailed to the nurse manages of each ICU to forward to their nursing staff and was also posted in all ICUs. Interested candidates could email the investigator, follow the link embedded in the recruitment email, or scan the quick response (QR) code on the flyer to obtain additional information and enroll in the program. Inclusion criteria included the following:

- Bedside registered nurse employed in any capacity in an adult critical care unit at UVA Health, including Medical ICU/Special Pathogens Unit, Nerancy Neuro ICU, Thoracic Cardiovascular ICU, Coronary Care Unit, Surgical Trauma ICU, ICU float pool, and critical care float nurses
- Over age 18

Exclusion criteria included the following:

- Currently practicing mindfulness at least two times per week, regularly

- Completed the 1% challenge through eMLife. The 1% challenge was a program that encouraged participation in eMLife, where participants committed 1% of their day, 14 minutes, as many days as possible during the program period to earn prizes.
- Travel nurse
- Being unable or unwilling to fulfill requirements of or complete the program, such as:
  - No daily access to internet by either cellphone or computer
  - Intending to leave position, either ICU nursing or UVA Health, within program duration
  - In the third trimester of pregnancy

Anticipated Sample Size

This program utilized $\alpha = .05$ with a power of .80. Hevezi (2016) conducted a similar program to this one and reported Cohen's $d = 0.7$. Thus, the power analysis for this program suggested a sample size of 33 (Polit, 2010, p. 421). This sample size was consistent with other power analyses used in similar programs. Attrition was a significant concern for a program such as this one, with attrition rates ranging from 0 to 26% in various studies (Cutshall et al. 2011; Daigle et al., 2018; Mealer et al., 2014). Assuming a median attrition rate of 10%, 37 participants were needed to reach power in this program.

Informed Consent Process

UVA Health considered this program to be an evidence-based, quality improvement and program evaluation project. Thus, UVA Health's Institutional Review Board (IRB) oversight was not required. Radford University concurred with UVA Health's designation of quality improvement and program evaluation, and both of those approvals are attached in Appendix A.

Since this program was considered quality improvement, informed consent was not required by either UVA Health or RU. Informed consent was obtained, however, and documented by an electronic attestation in Qualtrics at the beginning of the enrollment survey. See Appendix C for the entire enrollment survey, which includes the informed consent process and documentation. Potential subjects were informed of anticipated risks and benefits, discussed in the following section. Additionally, participants were informed that they could withdraw at any time, and for any reason, without penalty and continue using eMLife as they desired. Furthermore, they were made aware that their employment is in no way jeopardized by participation in, abstention from, or withdrawal from this program.

Anticipated Risks & Benefits

Participation in this program involved minimal risk. Despite a few studies showing potential risks associated with mindfulness practice, this program did not employ those same techniques of intensive practice. Mindfulness practice is readily available throughout the United States; UVA Health currently offers this intervention free to all employees through its Hoos Well program. Participants received information during enrollment regarding resources and services, such as counseling and therapy, available to them through UVA Health should they feel any psychological distress. Access to this information was provided during the informed consent process and attached in the email containing instructions for enrolling in eMLife (see Appendix E). The only cost to the participant was time. This cost, however, is hopefully outweighed by the potential benefits of increased mindfulness and increased professional quality of life.

Study Tools

In the 40 interventional studies evaluated during the literature review, there were 60 different tools utilized to measure outcomes. The most frequently used tool was the Conner-

Davidson Resiliency Scale, followed by the Perceived Stress Scale. The Five Facets Mindfulness Questionnaire (FFMQ) was the third most commonly used tool, with five studies utilizing it. This program used the FFMQ and the ProQOL-5. The rationale for their use and a detailed description of each tool are included in the following sections.

ProQOL-5

Validated measurement tools exist for each of the domains discussed in Chapter 1, but the ProQOL-5 provides the highest level view of the phenomena. The ProQOL-5 is a 30-item, self-report questionnaire measured on a 5-point Likert-style scale (Stamm, 2010). It assesses positive and negative experiences over the past 30 days. The scale measures three constructs: CS, BO, and secondary traumatic stress (STS). The ProQOL-5 scale has been well vetted in the literature, with psychometric properties reported in over 200 published papers totalling 1,187 measured administrations of the tool (Stamm, 2010, p. 13). Stamm (2010) reported Cronbach's $\alpha = 0.88$, 0.75, and 0.81, for the three subscale CS, BO, and STS, respectively (p. 28). The ProQOL-5 is available online, free for use in research or personal evaluation as long as proper credit is given (Stamm, 2010, p. 70).

The ProQOL-5 Scale is measured on a Likert-style scale, with one being "never" and five is "very often" (Stamm, 2010, p. 26). Of the 30 items, five items are reverse coded in scoring. The items of each subscale are then summed to create raw scores. Raw scores can range from 10 to 50. The subscales' raw scores can then be converted into *t*-scores. Stamm (2010) provided percentiles for both raw scores and t-scores. The ideal result is to see high levels of CS while seeing low levels of BO and STS. Stamm (2010) provided interpretive statements for five iterations of score results (pp. 22-23). This tool cannot be summed and presented as one data point; all three subscales must be discussed independently.

Interscale correlations show that CS shares a 2% shared variance (r = -.23, co-σ = 5%; n = 1187) with STS and a 5% shared variance (r = -.14, co-σ = 2%; n = 1187) with BO (Stamm, 2010, p. 13). BO and STS have a shared variance of 34% (r = .58, co-σ = 34%; n = 1187) which is likely due to the concepts' shared measurement of distress (p. 13). They differ, though, in that BO does not measure fear, while STS does (p. 13). Stamm (2010) reported fairly stable psychometrics for the tool when compared to various demographics, such as age, gender, income, race, and experience (pp. 19-21).

Three studies reviewed in this literature review utilized the ProQOL-5 scale, but only one reported Cronbach's alpha values (Duarte & Pinto-Gouveia, 2016; Duchemin et al., 2016; Hevezi, 2016). Duarte and Pinto-Gouveia (2016) reported Cronbach's α = .91 for CS, .78 for BO, and .61 for STS in their study (p. 101). These values are slightly different than those reported by Stamm (2010), who reported Cronbach's α = 0.88, 0.75, and 0.81, respectively (p. 28).

Most recently, Heritage et al. (2018) administered the ProQOL-5 to a sample of 1,615 Australian nurses in an attempt to evaluate the tool's psychometric properties using a Rasch analysis (p. 5). Using traditional analyses, Heritage et al. (2018) found α = .9, .8, and .84 for CS, BO, and STS, respectively (p. 5). However, utilizing the Rasch analyses, they found "notable imitations in measurement adequacy" for the BO and STS subscales (Heritage et al., 2018, p. 8). Specifically, they noted that "if researchers intend to examine relationships with BO and secondary traumatic stress as inferred by the ProQOL, we caution that this approach may require further clarification" (Heritage et al., 2018, p. 15). The authors proposed a 21-item scale that only consists of two subscales, CS and compassion fatigue. Stamm (2010) acknowledged some of this overlap in her discussion of the two domains' shared variance but held that their shared

measurement of distress does not outweigh STS's unique measurement of fear. Heritage et al. (2018) provided a conversion tool to retroactively adjust the three ProQOL-5 subscores to two ProQOL-21 subscores, so both results can be obtained to assess for significant differences. Since this program does not seek to deeply investigate the differences between BO and STS, this conversion was not performed in data analysis.

Five Facets Mindfulness Questionnaire

The FFMQ was the third most commonly used tool in the literature, with five instances of its use. The premise of this project is that improved mindfulness may improve other outcomes, such as resiliency, perceived stress, or pro-QOL. As such, a measurement of mindfulness should be included in any investigation about mindfulness practice as a measurement of intervention efficacy. Without knowing if the intervention improved mindfulness, one cannot know if the other observed outcomes were due to improved mindfulness or some other phenomenon. Only nine studies in this literature review measured mindfulness in any form.

FFMQ was first introduced by Baer et al. in 2006. Baer et al. (2006) set out to study how five previously established mindfulness tools varied in their correlations to numerous other variables, from openness to experience to absentmindedness. The researchers developed the FFMQ by having 613 university students complete the existing tools and used a scree plot to identify the five factors that accounted for most of the variance amongst scores (Baer et al., 2006, p. 8). By identifying the five factors most important to mindfulness, Baer et al. (2006) were able to reduce the 112 items that came from combining those five tools down to the 39 items that only assessed those five factors. Those 39 items became the FFMQ, and the five facets correlate to the five subscales of the tool.

The FFMQ contains five subscales, measuring the five domains of mindfulness: observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. Observing (OBS) pertains to "noticing or attending to internal and external experiences" such as scents or sensations (Baer et al., 2008, p. 330). Describing (DES) measures the degree to which one "labels internal experiences with words" (Baer et al., 2008, p. 330). Acting with awareness (AWA) "includes attending to one's activities of the moment and can be contrasted with behaving mechanically while attention is focused elsewhere (often called automatic pilot)" (Baer et al., 2008, p. 330). The fourth and fifth subscales, nonjudging (NJ) of and nonreactivity (NR) to inner experience, measure if an individual can perceive thoughts and feelings without labeling them as "good" or "bad" and allow those thoughts to pass freely "without getting caught up in or carried away by them" (Baer et al., 2008, p. 330).

The FFMQ is measured on a 5-point, self-report Likert-style scale, with one being "never or very rarely true" and five being "very often or always true" (Baer et al., 2008, p. 334). It contains five subscales, measuring the five domains of mindfulness. Of the 39 items, 16 items are reverse coded in scoring (Baer, n.d.). Each subscale has a range of scores from 8 to 40, with higher scores correlating to higher observation, with the exception of NR, which has a range of scores from 7 to 35 due to having one less question (Baer, n.d.). Baer et al. (2008) noted that four of the five subscales are positively correlated with psychological well-being in studies of different samples, with the exception being OBS. OBS, alone, in the non-meditator, can be correlated with maladaptive traits as the person becomes fixated on the inner experience without the counteracting traits of NJ and NR (Baer et al., 2008, p. 340). The FFMQ subscales are not summed and reported as a whole; the subscales were considered individually when evaluating

for change in this program. The ideal change would be to see an increase in all five subscale scores.

Five studies reviewed in this literature review utilized the FFMQ, with three reporting its psychometric properties (Duarte & Pinto-Gouveia, 2016; Duchemin et al., 2016; Gracia Gozalo et al., 2019; Wang et al., 2017; Wylde et al., 2017). Table 1 displays the Cronbach's α reported in those studies. The Cronbach's α values reported in these studies are consistent with the values seen in Baer et al. (2008), who saw a range from .72-.92 (p. 335). The FFMQ is available free for use, with appropriate credit given, from Baer's professional website (Baer, n.d.).

Table 1

Cronbach's Alpha for FFMQ Subscales in Various Studies

	Duarte and Pinto-Gouveia (2016)	Duchemin et al. (2016)	Wang et al. (2017)
Observe	.83	.83	.81
Describe	.9	.91	.76
Act with Awareness	.9	.87	.89
Non-judging	.84	.87	.79
Non-reacting	.72	.75	.46

Program Procedures

Appendix B contains a flowchart displaying participant movement through the program. A narrative description of the program is below.

Recruitment and Enrollment

IRB-reviewed recruitment materials were presented to all critical care nurses via email and on-unit flyers. Interested candidates could respond directly to the investigator via email to be provided a link to a Qualtrics survey, follow the link to the Qualtrics survey embedded in the recruitment email, or scan the QR code on the flyer to be directed to the Qualtrics enrollment survey. The survey educated potential participants about the program, obtained informed consent, and then screened for eligibility, given inclusion and exclusion criteria discussed previously. A copy of this survey is attached, in Appendix C. After consenting, via an attestation, participants provided an email address for weekly communications. Enrollment was rolling and open from September 15, 2020 through February 24, 2021.

Pretesting

A link to complete pretesting was available in at the end of the enrollment survey and sent to the email address provided. Participants chose their own unique ID. A copy of the pretest, including both tools, is located in Appendix D. Once pretesting was completed, participants were instructed to enroll in eMLife, with the plan to start the next Sunday. The scripting for that email, including instructions, is located in Appendix E.

Intervention

Every Sunday morning, an email was sent to participants that reminded them of the program and provided a link to a Qualtrics survey to which they should submit their progress report. The intervention consists of self-guided use of eMLife, with the goal of 15 minutes of use

6 days per week. Each week, participants submitted documentation of their interactions with eMLife for the previous week. The Sunday morning email included instructions on how to submit that report and a link to a Qualtrics survey where they would submit their progress reports. The progress report for Week 1 served as a control for any activity participants may have done in eMLife prior to the start of this program as well as to identify any difficulties they may have submitting the reports. Cohorts with any participants who failed to return a progress report received a follow-up email on Tuesday evenings. Appendix E includes a copy of all of the email scripting used in these weekly emails and a copy of the weekly data collection survey. Participants missing three or four weekly logs were considered noncompliant, and their posttests would not be included in data analysis. Any satisfaction surveys they returned, however, would be included.

Posttesting

The Week 5 email included two links. The first link took participants to the final progress report. The second link led to posttesting. In posttesting, the two tools and a brief satisfaction survey were administered. A copy of the posttest is attached, in Appendix F.

Follow-Up Survey

After five months of data collection, there were five completed posttests. This suggested to the investigator that a baseline assumption about the program was incorrect—nurses may not be interested in this intervention. To elucidate this phenomenon, a follow-up survey was distributed to ICU nurses to assess their knowledge, skills, and attitudes regarding mindfulness practice and their barriers to practicing mindfulness. This modification was approved as non-human subjects research by both UVA Health and RU's IRBs. Their approvals are attached, in Appendix G. The survey was distributed in the same manner as the original project: Unit

managers forwarded a recruitment email to nurses and flyers were posted on each unit. Inclusion criteria were the same as the original program, but there were no exclusion criteria. Participants were incentivized to participate by offering the option to be entered into a drawing for one of four $25 gift cards at the end of the survey. A copy of the survey is attached in Appendix H.

The survey sought to answer the following questions:

1. Do ICU nurses have awareness and understanding of mindfulness practice?
2. Do ICU nurses have mindfulness training or experience?
3. What interest do ICU nurses have in practicing mindfulness?
4. What barriers to mindfulness practice do ICU nurses experience?

These added questions helped answer the ultimate question that came out of the first part of this program: What qualities should hospital-provided mindfulness practice programs contain to address the gap between the knowledge of mindfulness practice and the regular practice of mindfulness amongst ICU nurses? Survey questions were written by the investigator to address the questions listed above.

Data Management

Collection

Data were collected entirely through Qualtrics at weekly intervals over 5 weeks. A copy of pretesting, including the demographics survey and the two tools, and weekly log survey are attached in Appendices I and K, respectively. All documentation is linked to the participant by the unique ID the participant chose in pretesting. The ID was entered on all forms except the enrollment survey. The data was then exported to the Statistical Package for Social Sciences (SPSS) for statistical analysis. Data were stored on a private, password protected laptop that was accessible only to the investigator. The data, as stored in Qualtrics, was destroyed following the

completion of the program. Data, as recorded in SPSS, will be stored for a minimum of 3 years, in accordance with the Department of Health and Human Services' (2020) guidelines.

Security

The only potentially identifying information that was gathered from participants was their email address. The email address and subject identity were never linked to the participant's ID. There was potential for the investigator to link subjects through email addresses when using UVA Health email addresses. The investigator used her RU email address so that participants' email addresses would not automatically populate with the participants' names. Additionally, in order to not identify the data, the investigator chose to not process any survey results until the end of data collection. Other email address mitigation strategies included the following:

1. Email addresses were entered by participants into the enrollment survey after obtaining informed consent and stored in a password-protected Qualtrics account that was accessible only to the investigator.
2. Email addresses were transcribed by the investigator into a password-protected Excel spreadsheet that sorted participants into cohorts.
3. Email correspondence were only to one participant at a time. There were no carbon copy or blind carbon copy correspondences utilized in this program between the investigator and participants.
4. Email correspondence were permanently deleted from the investigator's RU email account as each participant completed or withdrew from the program.
5. Each page of the Excel spreadsheet containing email addresses was deleted as cohorts completed the program.

6. Email addresses were disclosed by participants in the same Qualtrics survey as the informed consent documentation due to technological constraints and social distancing. The Department of Health and Human Services' (2020) Office for Human Research Protections requires all informed consent forms be saved for 3 years following completion of the project. In this program, the only protected information collected—email addresses—were recorded on the consent form. Due to the program being considered not-human subjects research, informed consent was not required. This allowed email addresses, as entered in the Qualtrics survey that also contains documentation of consent, to be destroyed following completion of the program. The investigator permanently deleted the survey, which included the informed consent documentation and email addresses, after the program was completed.

Management

Data were cleaned using manual review. Items were reviewed for appropriateness, and missing data points were coded as "999" in SPSS. As often as possible, "other" response fields were recoded into the appropriate answer choice. For example, several respondents chose "other" for which unit they worked on and entered the COVID-19 ICU. That unit is housed under the MICU, so those answers were recoded as MICU. If no such option existed, "other" responses were left as entered by the participant. Pretests were manually reverse coded as directed and summed.

Proposed Statistical Analyses

The FFMQ and the ProQOL-5 are both measured on a 5-point Likert-style scale. Likert-style tools are considered interval-level measurements (Polit, 2010, p. 8). Participants took the FFMQ and ProQOL-5 prior to starting the program and again the week following the program's

end. As such, a dependent or paired sample *t*-tests would be appropriate to test for change in both tools (Polit, 2010, p. 121).

Compliance to the published program schedule was measured by weekly reporting. Participants reported total minutes practiced and total sessions completed in eMLife in the weekly logs. Both of these variables—total weekly minutes and number of sessions—are measured on the ratio level (Polit, 2010, p. 8). Both variables related to intervention implementation can be correlated to the two tools to assess if there is a relationship between either variable and the results seen. Pearson's *r* can be utilized to assess for that relationship (Polit, 2010, p. 8). The follow-up survey was analyzed using descriptive statistics and qualitative analysis.

Chapter 4: Results

The purpose of this project was to assess the effectiveness of an entirely asynchronous, web-based mindfulness program, eMLife. The PICOT question for this project is as follows: In adult ICU nurses, does participating in an asynchronous, web-based mindfulness program improve mindfulness and pro-QOL scores over the course of four weeks? The independent variable is participation in eMLife, as measured by total minutes spent in eMLife and total sessions completed. The dependent variables are mindfulness and pro-QOL.

The questions this program will attempt to answer are as follows:

1. Does participation in eMLife impact mindfulness, as measured by the FFMQ? The null hypothesis (H_0) is that participation will not alter mindfulness. The hypothesis (H_1) is that increased participation in eMLife will improve mindfulness.
2. Does participation in eMLife impact nursing pro-QOL, as measured by the ProQOL-5? The null hypothesis (H_0) is that participation will not impact ProQOL-5 scores. The hypothesis (H_1) is that increased participation in eMLife will improve ProQOL-5 scores.

The follow-up survey attempts to answer the following research questions:

1. Do ICU nurses have awareness and understanding of mindfulness practice?
2. Do ICU nurses have mindfulness training or experience?
3. What interest do ICU nurses have in practicing mindfulness?
4. What barriers to mindfulness practice do ICU nurses experience?

These questions help answer the ultimate question that came out of the first part of this program: What qualities should hospital-provided mindfulness practice programs contain to address the gap between the knowledge of mindfulness practice and the regular practice of

mindfulness amongst ICU nurses? The data, as presented following, attempts to answer these questions.

Mindfulness Intervention Program

Sample Description

During the enrollment window, 33 potential participants started the enrollment survey. One survey was incomplete, nine were ineligible due to currently practicing mindfulness, two were ineligible for having participated in the 1% challenge, and one participant was ineligible due to not having daily access to the internet. This resulted in 20 potential participants enrolling in the program. Of the 20 enrolled participants, 19 participants started the pretest. One participant did not complete either tool, and one participant did not complete the ProQOL-5. Figure 4 displays participant engagement and attrition throughout the program. All participants were female. There was representation from all ICUs with the exception of the surgical-trauma ICU, with total counts available in Table 2. Descriptive statistics regarding participants' age and experience levels are provided in Table 3. Nearly 85% of participants reported working full-time or overtime, with full descriptions available in Table 4.

Figure 4

Participant Engagement and Attrition Throughout the Program

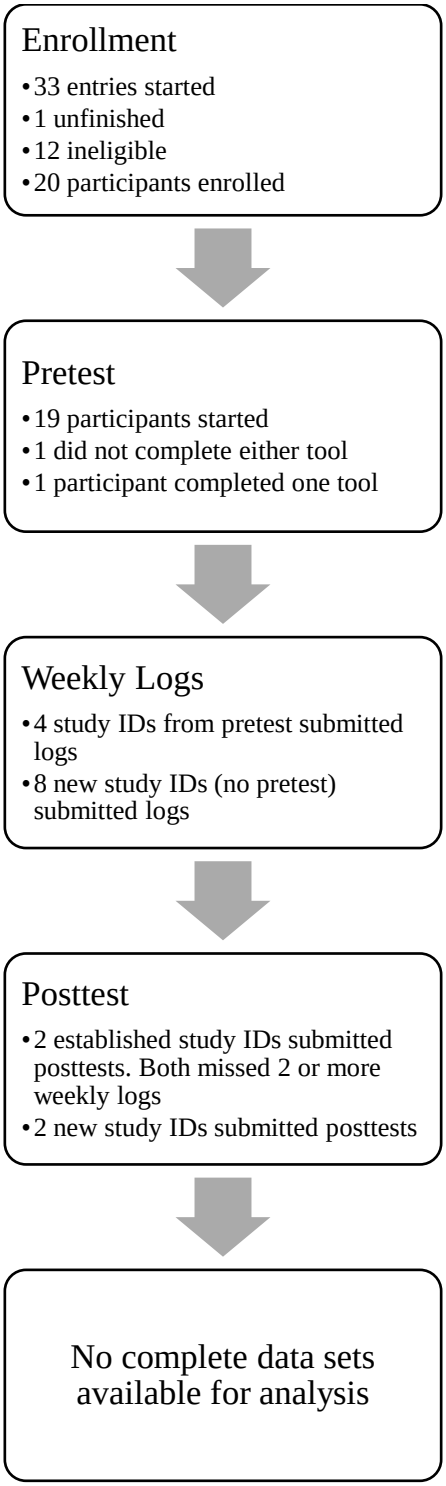


Table 2

Frequency Table of Nursing Units Represented

	Frequency	Percent	Valid Percent
MICU	7	38.9	41.2
TCVICU	4	22.2	23.5
CCU	2	11.1	11.8
NNICU	1	5.6	5.9
SRO	3	16.7	17.9
Total	17	94.4	100
Missing	1	5.6	

Note. MICU = Medical Intensive Care Unit, TCVICU = Thoracic Cardiovascular Intensive Care Unit, CCU = Coronary Care Unit, NNICU = Nerancy Neuro Intensive Care Unit, SRO = Staffing Resource Office

Table 3

Participant Years of Experience

	Years a Nurse	Years an ICU Nurse	Years on Current Unit
Number	18	18	18
Mean	7.444	6.083	4.844
Median	5.0	5.0	4.0
Mode	5.0	5.0	5.0[a]
Minimum	0.5	0.5	0.5
Maximum	22.0	22.0	17.0
Range	21.5	21.5	16.5
Standard Deviation	6.1402	5.4725	4.7385

[a] years 1, 2, and 5 all had a frequency of 3. The largest is shown in the table.

Table 4

Average Hours Worked per Week During Last Month

	Frequency	Percent
12 hours or less	1	5.6
13-24 hours	2	11.1
25-36 hours	6	33.3
37-48 hours	9	50.0
Total	18	100.0

Results

As discussed previously, this program failed to recruit enough participants for a power analysis. As seen in Figure 4, 20 participants started the pretest, and 18 participants completed it. Of those 20, four participants submitted progress reports. Eight participants seemingly changed IDs after the pretest, so their engagement data and posttests cannot be linked to the pretest. Participants were asked to choose an ID during pretesting that would be entered on each data submission during the program, yet 8 participants entered new IDs during data entry. Thus, engagement and posttest data cannot be linked to pretest data. Four participants completed the posttest. Two of those participants did not submit two weekly logs, and two changed IDs during the program, so no tools from the posttests can be included in data analysis. The tools from the pretests are discussed in the following two sections as snapshots of the state of pro-QOL and mindfulness in ICU nurses in the midst of the COVID-19 pandemic.

Professional Quality of Life. Seventeen participants completed the ProQOL-5 during the pretest. In the CS domain, scores ranged from 28-47 with a mean of 38.88. The BO subscale scores ranged from 20-33, with a mean of 25.47. The STS subscale ranged from 17-30, with a mean of 24.76. The standard deviation, skewness, and kurtosis for each subscale are in Table 5. Stamm (2010) provided cut scores for the mean at the 25th and 75th percentiles, which are 23-41 for all subscales (pp. 29-30). No participant demonstrated low CS, and six participants (35%) demonstrated high levels of CS. On the BO subscale, five participants (29%) scored below the 25th percentile, implying low levels of BO, and none scored above the 75th percentile. For the STS subscale, six participants (35%) scored below the 25th percentile, suggesting low levels of STS, and none scored above the 75th percentile.

Table 5

Descriptive Statistics for ProQOL-5

	N	Min	Max	Mean	SD	Skewness		Kurtosis	
						Statistic	SE	Statistic	SE
CS	17	28	47	38.88	5.700	-0.436	0.550	-0.539	1.063
BO	17	20	33	25.47	4.317	-0.453	0.550	-1.228	1.063
STS	17	17	30	24.76	4.131	-0.497	0.550	-0.916	1.063

Note. ProQOL-5 = Professional Quality of Life Version 5, CS = compassion satisfaction, BO = burnout, STS = secondary traumatic stress, n = number, min = minimum, max = maximum, SD = standard deviation, SE = standard error

Five Facets of Mindfulness Questionnaire. The FFMQ subscales—OBS, DES, NJ, NR, and AWA—are also all reported separately. Full descriptive statistics are available in Table 6. The domain with the highest mean was DES, mean = 26.22; followed by OBS, mean = 24.61; AWA, mean = 24.44; NJ, mean = 23.61; and lastly, NR, mean = 19.83 Note that NR has a smaller possible range, 7-35, as compared to the other subscales' range of 8-40. Even when correcting for that difference, it still had the lowest mean.

Baer et al. (2008) provided means for 4 different groups of people that can be used to benchmark the results seen in this program, seen in Table 7. The four categories were 293 non-meditating community members, 180 regular meditators, 197 highly educated non-meditators (demographically similar to the regular meditators), and 213 non-meditating undergraduate students (pp. 332-334). While many of these values are not significantly different, the nurses in this program scored the lowest for acting with awareness and non-judging the inner experience and were not far removed from being the lowest in observing and non-reacting.

Table 6

Descriptive Statistics for FFMQ

	N	Min	Max	Mean	SD	Skewness		Kurtosis	
						Statistic	SE	Statistic	SE
OBS	18	12	36	24.61	5.982	-0.217	0.536	-0.014	1.038
DES	18	16	34	26.22	4.906	-0.638	0.536	-0.115	1.038
NJ	18	8	38	23.61	8.067	-0.262	0.536	-0.025	1.038
NR	18	13	28	19.83	4.502	-0.143	0.536	-0.678	1.038
AWA	18	16	32	24.44	5.596	-0.438	0.536	-1.463	1.038

Note. FFMQ = Five Facets Mindfulness Questionnaire, OBS = observing, DES = describing, NJ = nonjudging, NR = nonreacting, AWA = acting with awareness, n = number, min = minimum, max = maximum, SD = standard deviation, SE = standard error

Table 7

Comparing Nurse FFMQ Scores to Other Samples

	Nurses	Students	Community	Educated	Meditators
OBS	24.61	24.32	24.32	27.04	31.96
DES	26.22	26.42	24.63	30.01	31.84
AWA	24.44	25.31	24.57	28.32	28.08
NJ	23.61	27.75	23.85	29.13	32.44
NR	19.83	20.50	19.53	22.82	25.70

Note. Data retrieved from Baer et al., 2008, p. 337. Values in red are the lowest value for each row. OBS = observing, DES = describe, AWA = acting with awareness, NJ = nonjudging, NR = nonreacting

Mindfulness Survey Findings

Follow-Up Survey

The follow-up survey had 125 recorded responses. One response was ineligible according to the screening question, and seven responses were incomplete, leaving 116 surveys to be analyzed. Participants were primarily female (85%, $n = 98$) and 15% ($n = 17$) were male. Participants ranged in age from 22 to 66, with a median age of 28 years old. Their experience and current units are presented in Tables 8 and 9, respectively.

Table 8

Follow Up Survey Participant Years of Experience

	Years a Nurse	Years an ICU Nurse	Years on Current Unit
Number	115	115	116
Missing	1	1	0
Mean	6.5731	5.2644	3.9522
Median	4.5	3.0	2.0
Mode	1.5[a]	2.0	1.0
Minimum	0.25	0.25	0.1
Maximum	35.0	31.5	29.75
Range	34.75	31.25	29.65
Standard Deviation	7.07385	6.01381	5.02592

Note. [a]1.5 and 5.0 were tied for most frequently occurring, with 10 occurrences each

Table 9

Follow Up Survey Nursing Units Represented

	Frequency	Percent
MICU	65	56.0
TCVICU	15	12.9
CCU	15	12.9
STICU	4	3.4
NNICU	12	10.3
SRO	5	4.3
Total	116	100

Note. MICU = Medical Intensive Care Unit, TCVICU = Thoracic Cardiovascular Intensive Care Unit, CCU = Coronary Care Unit, STICU = Surgical Trauma Intensive Care Unit, NNICU = Nerancy Neuro Intensive Care Unit, SRO = Staffing Resource Office

Analysis of Investigation Questions

Question One. The first question this survey hopes to answer is: Do ICU nurses have awareness and understanding of mindfulness practice? Nearly 89% of participants (*n* = 103) had heard of mindfulness practice, with 63% (*n* = 73) of those who had heard of it reporting hearing about it less than daily but more than once per month. A full frequency table is seen in Table 10. It appears that, yes, nurses do have an awareness of mindfulness. Of those who had heard of mindfulness, 70.7% (*n* = 82) reported having an understanding of mindfulness practice. Of those 82 participants, 76 wrote a one-sentence description of mindfulness practice. When those descriptions were analyzed thematically for presence of the five facets of mindfulness, AWA was the most common theme to emerge from the descriptions, with 25 instances. OBS was the next most common, with 20 occurrences. DES and NJ both appeared nine times, and NR appeared four times. Nine submissions contained two facets; none had more than two facets present. The word "stress," and thematically similar words, appeared in 28 descriptions, and the word "present" or "moment" also appeared in 28 descriptions. Sixteen descriptions did not include any of the five facets of mindfulness or were incorrect. For example, one response stated: "Connecting with yourself and blocking out all other distractions" and another stated "… allowing yourself to exist in that space without focusing on external stimulus." Both of those descriptions take the opposite of "observing," which has participants notice external stimuli around them.

Table 10

Frequency of Hearing about Mindfulness

	Frequency	Percent	Valid Percent
Daily	2	1.7	1.9
More than once per week	24	20.7	23.3
More than once per month	49	42.2	47.6
A few times per year	28	24.1	27.2
Total	103	88.8	100
Missing	13	11.2	
Total	116	100	

Question Two. The second question asks if ICU nurses have mindfulness training or experience. Of the 102 respondents, 67.6% (*n* = 69) had not had formal training, while 32.4% (*n* = 33) had participated in formal mindfulness training. When asked if they believed that they had the skills and resources to practice mindfulness today, 61.2% (*n* = 71) believed that they did, while 37.1% (n = 43) believed that they did not. With similar results, 67.2% (*n* = 78) of participants had practiced mindfulness before, while 30.2% (*n* = 35) had never practiced mindfulness before. Of those who had practiced mindfulness before, 62.8% (*n* = 49) practice mindfulness now.

Question Three. The third question asks what interest ICU nurses have in practicing mindfulness. Of those who have never practiced mindfulness, 37.1% (*n* = 13) were neither interested or uninterested in trying mindfulness, and 48.5% (*n* = 16) were somewhat interested in trying mindfulness. The most common reasons for not practicing mindfulness reported by those not currently practicing mindfulness (*n* = 63) were forgetting (50.8%, *n* = 32), not knowing how to do it (46%, *n* = 29), and not having enough time to do it (36.5%, *n* = 23). Other responses included finding other activities more effective (*n* = 3), being uncomfortable with practicing in group settings (*n* = 1), and finding it difficult to perform (*n* = 1). Among those who report practicing mindfulness (n = 46), engagement varied widely. The most frequently reported engagement was less than 15 minutes a few days per week, with 28.3% (*n* = 13) of practicing participants. This was followed by equal distributions of less than 15 minutes most days of the week and irregular practice, both with 23.9% (*n* = 11). When asked if they would like to practice mindfulness more, 70% of respondents (*n* = 77) felt that they could derive more benefit from mindfulness with more time. Meanwhile, 15.5% (*n* = 17) did not feel like more time invested

would result in greater benefit, and 8.2% (*n* = 9) did not practice mindfulness and did not want to start.

Question Four. The fourth question assessed barriers to mindfulness practice faced by ICU nurses. The most common barrier cited was forgetfulness (34.4%, *n* = 33), followed by not having enough time (30.2%, *n* = 29) and being stuck in a rut/struggling to find techniques (24%, *n* = 23).

Question Five. The final question, assessing what qualities hospital-provided mindfulness practice programs should contain to address the gap between the knowledge of mindfulness practice and the regular practice of mindfulness amongst ICU nurses, can be drawn from assessing the above information as well as looking at the habits of practicing participants. Respondents reported using a wide variety of resources to practice mindfulness. The most frequently reported resource was memorized techniques (57.4%, *n* = 27), followed by podcasts/audiotapes (29.8%, *n* = 14) and phone-based apps (25.5%, *n* = 12). Participants reported eight different applications and eight additional resources, listed in Table 11. Of the 46 responses for the question asking “Why do you practice mindfulness?”, 17 included the word “stress,” while 12 included thematically similar words (63%, *n* = 29). Ten responses (21.7%) discussed the theme of emotional regulation.

Table 11

Apps and Resources Used to Practice Mindfulness

Applications (Apps) Used	Other Resources Used
Calm x2	Books x3
Insight Timer x2	Classes x2
IFit	None x2
Holy Bible app	Nature
EMLife	"Time away"
Simple Habit	"Thought reflection"
Headspace	Yoga
Spotify for "wordless music"	

Note. "x2" or "x3" indicate the frequency of which each response was entered. If not marked, it only occurred one time.

Summary

The nurses who completed the pretest tools demonstrated similar mindfulness to undergraduate students and non-meditating community members, but lower levels of mindfulness when compared to non-meditating highly educated persons (Master's degree or higher) and meditating people. None of the participants reported high levels of BO or STS, and none reported low levels of CS. In fact, 35% reported high levels of CS, 29% reported low levels of BO, and 35% reported low levels of STS. When evaluating nurses' knowledge, skills, attitudes, and barriers of and to mindfulness practice, nearly 90% had heard of mindfulness practice, and it seems that most have heard of it in the context of stress relief. An in-depth discussion of the context surrounding these results and the implications of these findings follows.

Chapter 5: Discussion

Interpretations

The purpose of this project was originally to assess the effectiveness of an entirely asynchronous, web-based mindfulness program, eMLife, by measuring mindfulness and pro-QOL scores over the course of 4 weeks. Unfortunately, enrollment was too low to achieve power, and no participant had a complete data set to compare pretests and posttests. The tools, however, could be used as a modest spot check of nurses' pro-QOL and mindfulness. The follow-up survey sought to elucidate some possible explanations for the program's struggles by assessing ICU nurses' knowledge of and skills, attitudes, and barriers towards mindfulness practice. Ultimately, these should help answer the ultimate question that came out of the first part of this program: What qualities should hospital-provided mindfulness practice programs contain to address the gap between the knowledge of mindfulness practice and the regular practice of mindfulness amongst ICU nurses?

Professional Quality of Life

It was unexpected that the nurses who completed the pretest reported such high pro-QOL. No participant reported a score below the 25th percentile in any domain (a score of 22 or less), and five or six participants scored above the 75th percentile (a score of 42 or more) in each domain. When looking at the group means, the CS averaged a score 38.88, which is on the high end of moderate range. For the CS subscale, unlike the BO and STS scales, a high score is a positive finding, whereas for the BO and STS subscales, a low score is a positive finding. The BO subscale scores averaged 25.47, which is also the high end of the moderate range. The STS subscale averaged a score of 24.76, which, like the other two subscales, is on the high end of the moderate range.

These findings are unexpected. As mentioned in Chapter 1, it is estimated that 25-33% of critical care nurses have severe BO, with 86% having at least one of the three symptoms, although study results range from a 0-80% incidence rate (Browning, 2019, p. 532; Moss et al., 2016, p. 370). Similarly, 18-44% of ICU nurses meet diagnostic criteria of PTSD (Mealer et al., 2009, p. 1121; Mealer et al., 2014, p. e101). These trends are further corroborated by recent trends in nursing turnover rates. From calendar year 2019 to 2020, nursing turnover rates increased from 15.9% to 18.7%, the highest rate over the last 5 years (Nursing Solutions, Inc, 2021, p. 6). More specifically, critical care nurses saw an increase in turnover, from 18.1% to 18.7% (p. 8).

There are several possible explanations for the aberrancy seen in this program. As noted elsewhere, only 17 participants completed this tool, so it is highly likely that these responses are not representative of ICU nurses as a whole. Secondly, based on the known behavior that BO and traumatized employees are disengaged, it is likely that those who are the most BO and traumatized did not participate in this program. Additionally, the ProQOL-5 is a good "big picture" tool, but it does not measure BO or PTSD as sensitively as other tools. Perhaps a more sensitive tool would have shown a different result, but it also may be that the sample was an incomplete representation of the population. Finally, the high CS scores may have been high because of the pandemic. The COVID-19 pandemic may have provided ICU nurses with a more clearly defined sense of purpose and satisfaction. Seven of the 17 participants were MICU nurses, who were charged with primarily staffing the COVID-19 ICU at UVA Health. As respiratory and infectious disease nurses, MICU nurses may have found the transition to COVID-19 nursing familiar, but professionally challenging, and found satisfaction in that work.

Mindfulness in Non-practicing ICU Nurses

The 18 nurses who completed the FFMQ demonstrated similar levels of mindfulness as undergraduate students and community members, according to findings reported by Baer et al. (2008). Those 18 nurses had lower levels of mindfulness as compared to highly educated non-meditators (a master's degree or higher) and regular meditators (Baer et al., 2008). These findings are consistent, as these nurses report being non-meditators, and most bedside nurses have either an associate's or bachelor's degree. Unfortunately, education level demographics were not collected for this program. Interestingly, the underlying hypothesis of this program was that increased mindfulness would increase pro-QOL, but with baseline low mindfulness and high pro-QOL, how much would pro-QOL have improved with increased mindfulness?

For nurses in the follow-up survey who have never practiced mindfulness, none were not at all interested in trying mindfulness. Granted, nurses who were not at all interested in mindfulness may not have participated on a survey about mindfulness, but the findings are encouraging. The majority of respondents, 45.7% (n = 16), were somewhat interested in trying mindfulness. The next most common response was being neither interested or uninterested with 37.1% (n = 13). Finally, four participants (11.4%) were very interested in trying mindfulness. There seems to be a large pool of potential participants, if the program were designed and implemented well.

For those who had practiced mindfulness before, but do not currently practice, the largest reported barrier was forgetting to practice it (50.8%, n = 32). This was followed by not knowing how to do it and not having enough time (46%, n = 29 & 36.5%, n = 23, respectively). As future program developers consider essential components to new programs, integrated reminders that are customizable to a nurse's dynamic schedule may improve compliance and reduce attrition. It

is also worth pointing out that 22.3% (*n* = 14) of participants who had practiced mindfulness before but are not currently provided a more negative experience to their former practice—either not liking it, not deriving any benefit from it, or not deriving enough benefit to outweigh the time invested. That group of people may be harder to engage than others, as there are some negative experiences to unlearn.

Mindfulness in Practicing ICU Nurses

Of the 116 survey respondents, 49 (42.2%) nurses self-reported that they currently practice mindfulness. On the surface, those findings are promising; however, on a closer evaluation, the findings are less so. Only five nurses (4.3%) reported practicing mindfulness the recommended 15 minutes or more most days of the week. The most common response was less than 15 minutes a few days of the week (11.2%, *n* = 13) followed by a tie between less than 15 minutes most days of the week and irregular practice (9.5%, *n* = 11). These findings, combined with the reality that only 33 participants (28.4%) had any formal training in mindfulness practice, paints a concerning picture.

Of the 33 participants who had formal mindfulness training, 11 (33%) were not currently practicing mindfulness and seven (21%) practiced irregularly. Only one participant with formal training practiced more than 15 minutes most days of the week, while six participants practiced less than 15 minutes most days of the week and six practiced less than 15 minutes a few days per week. This leads to puzzling questions—why does formal training not correlate to current practice and how did four other nurses come to practice mindfulness daily without any formal training? These ideas are explored more in the following section.

Defining Mindfulness

One of the more interesting topics of exploration in this program was asking nurses how they defined mindfulness. Responses varied widely, including:

- "Being aware of what is going on around you through being present and focusing with all bodily senses."
- "Taking time each day to do something that settles your mind and rejuvenates you"
- "In the hospital setting, a patronizing reminder to not have expressive emotions. Outside, a centering method to help process the world."
- "Practicing relieving stress through activities that brings us joy"
- "Zenful energy"

These responses reflect a wide range of impressions of what mindfulness practice is. Baer (2006) defined mindfulness as "bringing one's complete attention to the experiences occurring in the present moment, in a nonjudgmental or accepting way" (p. 27). It is interesting to note that 41 of the 76 definitions included the positive benefits of mindfulness as part of what mindfulness inherently is.

The misunderstandings of what mindfulness is may play a part in the results seen in the previous section. It is possible that the 33 participants with formal training had a stricter understanding of what mindfulness practice was and was not, so they did not consider certain actions to be mindfulness. Meanwhile, those without formal training may have a more broad conceptualization. When asked what resources participants used to practice mindfulness, some answers included the "Holy Bible App," "Spotify for wordless music," "nature," "time away," and "thought reflection."

Carlson (2018), a clinical psychologist who specializes in MBI in medical populations, provided some commentary that helps contextualize this understanding of mindfulness.

> There has been a shift from marketing "meditation" (which is now considered old-fashioned hippy stuff, way too time-consuming and hard to do), to "mindfulness," which is wonderful, hip, new, and easy. This was most strongly brought home to me during a phone conversation a few years ago with the (female) head of Human Resources of a large American corporation, who was considering offering mindfulness programs to their thousands of employees. I was on the call to discuss the research results of clinical trials, and she said something along the lines of "We like mindfulness because it is easier to do than meditation; we cannot expect our employees to meditate, but they can learn mindfulness." I was shocked into silence. I did not know what to say. The fact of the matter is you learn mindfulness *through* meditation practice, it *is* meditation; there is no shortcut. In my mind, the two were indistinguishable, I had never even considered the possibility of learning mindfulness without meditation.
>
> Before this encounter, it had never occurred to me what the lay understanding of mindfulness actually was. Then I saw it; if you could just all of a sudden be "awake and aware in the present moment, non-judgmentally" and live your life this way, myriad of benefits would come your way. But the path to becoming mindful in everyday life has somehow become a little lost. Maybe this is because we as teachers and researchers talk about mindfulness in two ways: a way of being in the world (i.e., you can be more or less mindful at any given moment), and as a practice (mindfulness meditation) which helps to cultivate this skill. The lay understanding seems to have taken the former and ignored the latter. There is a lack of understanding that meditation practice is necessary to fully

> develop the ability to be mindful in everyday life. People seem to think they can read a book, snap their fingers and all of a sudden be "mindful" all the time. This fits with the "fast-food" culture in much of America; wanting results and wanting them now. (p. 4)

A more in-depth discussion of the implications of Carlson's observations and these findings will be discussed in a following section, but her observations ring true to the findings of this program. The benefits of mindfulness have overshadowed the process of becoming mindful. This phenomenon is best encapsulated in one participant's comment: "It's not something I think about and on the rare occasion I have attempted it did not seem to help." A few square breaths, without the requisite training and development, will not prevent BO in ICU nurses in the midst of a pandemic. Carlson's statements also explain another interesting finding: 61% (n = 71) of nurses who had heard of mindfulness practice believed that they had the skills and resources to practice it today, if they wanted to do so. More than double the number of formally trained participants believed that they could practice mindfulness. This suggests that the version of mindfulness advertised to lay people is an inaccurate representation of the true practice.

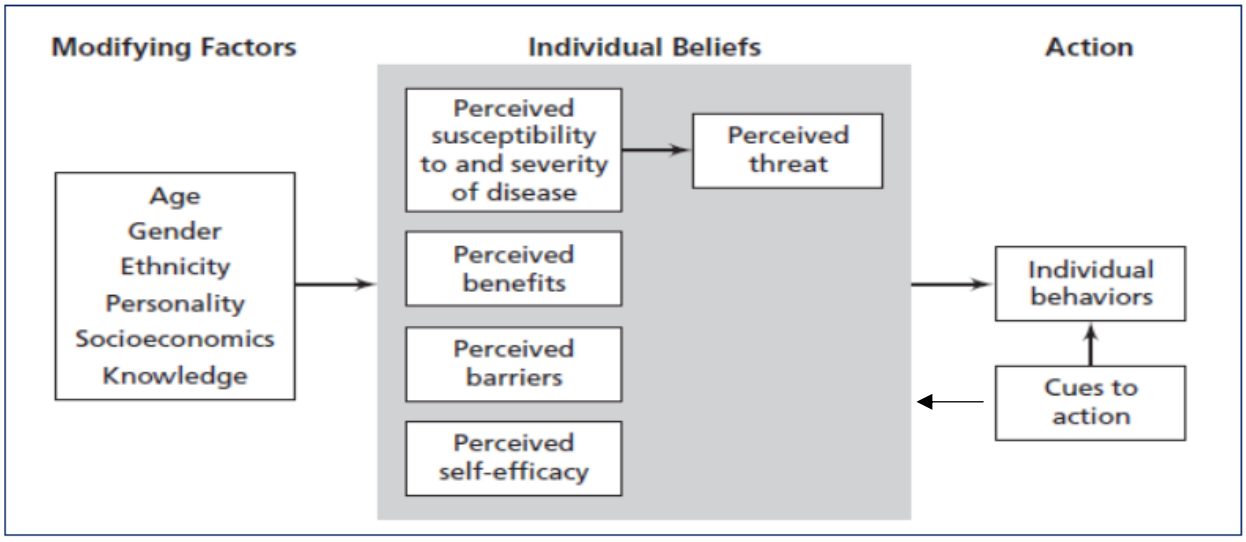
Model Evaluation

This program was built upon the ProQOL Model, which purports that pro-QOL is comprised of three environments: the work environment, the client environment, and the person (carer) environment (Stamm, 2010, p. 10). CS and compassion fatigue, a combination of workplace trauma and BO, are the measures of pro-QOL. Each environment can influence both measures. This model worked well for understanding who held which responsibilities in improving pro-QOL and categorizing interventions that might improve pro-QOL, the overall goal of this investigation.

Where this model failed was as a change model at the granular, individual level. After seeing the outcomes of the program, a change model, such as the Health Belief Model or the Transtheoretical Model of Change (see Figures 5 and 6, respectively) may have been more effective, especially in the first phase of this program. The Health Belief Model captures much of the external factors that make a person aware of their need for mindfulness, aware of mindfulness itself, and their own ability to implement it and exact change in their life. The Transtheoretical Model of Change identifies the six sequential steps people go through when making a positive change. Each of these six steps can be seen in different responses to the survey. Future programs may use a change model to group similarly staged nurses together for a targeted intervention based on their level of readiness for change.

Figure 5

Health Belief Model



Note. Figure obtained from Skinner et al., 2015, p. 79.

Figure 6

Transtheoretical Model of Change

Note. Image retrieved from https://transtheoreticalhl250.weebly.com/key-points.html

Limitations

The sample size, attrition rate, and lack of power analysis greatly limit this program. This program sought to contribute to the body of literature by conducting a power analysis on the changes that stem from regular mindfulness practice, but low enrollment rates and high attrition rates made that endeavor unsuccessful. A large sample, with representation from all units, both genders, and a wide range of age and experience, was recruited for the survey. This improves the generalizability of those findings.

One notable limitation in the generalizability of this program's findings is the culture of mindfulness at UVA Health. UVA Health's mindfulness culture is fed by partnerships with the Compassionate Care Initiative, a program of the UVA School of Nursing, the Mindfulness Center, a program of the UVA School of Medicine, and the Contemplative Sciences Center, an independent department within UVA. The Compassionate Care Initiative's purpose "is to cultivate a resilient and compassionate healthcare workforce… through innovative educational and experiential programs" (Compassionate Care Initiative, n.d.). Similarly, the Mindfulness Center's mission is "to support the integration of mindfulness-based practices into the clinical, educational, and research programs of the UVA Health System (Mindfulness Center, n.d.). Finally, the Contemplative Sciences Center's mission "is to advance the study and application of human flourishing at all levels" (Contemplative Sciences Center, n.d.).

UVA Health's Faculty and Employee Assistance Program coordinates all available resources from these programs and regularly presents them to UVA Health nurses. Throughout the pandemic, UVA Health sent a daily email with COVID-19 and health system updates, and there was almost always an invitation to a program offered by one of these three programs. Interestingly, nurses primarily reported hearing about mindfulness more than once a month but

less than once per week. A frequency of responses can be seen in Table 11. It would suggest that nurses do not remember most of the invitations to practice mindfulness that are generated.

Additionally, UVA Health recruits many nurses from UVA's School of Nursing. These nurses are trained in mindfulness during their education through the Compassionate Care Institute. Unfortunately, this program did not collect demographics on where nurses were educated to be able to see if being educated in mindfulness during nursing school impacted their current practices of mindfulness.

One possible explanation for the struggles this program experienced is the "file drawer problem." The file drawer problem is the "risk that, because [of the] bias towards publishing statistically significant results, unpublished work, which did not yield significance, may exist, therefore giving the false impression of significance" (Burton et al., 2016, p. 9). For Burton et al.'s (2016) meta-analysis that showed a combined power of $p < .00002$ for MBI improving stress levels in healthcare workers, 44 nonsignificant studies would have to exist to render these findings insignificant (p. 9). It seems likely that 45 studies, such as this program, exist unpublished.

Implications

For Policymakers

Since 2008, the healthcare system has striven for Triple Aim: to improve outcomes, improve the patient experience, and reduce costs (Bodenheimer & Sinsky, 2014, p. 573). These unrealistic expectations have put undue burdens on healthcare employees, and the results—discussed in earlier sections—are detrimental to the field as a whole. Bodenheimer and Sinkey (2014) introduced a fourth aim, with the understanding that without healthy healthcare workers, the Triple Aim can never be achieved. The fourth aim, to improve the work life of healthcare

workers, needs to be as equally emphasized at all levels of the healthcare system as outcomes, the patient experience, and the bottom line (p. 575).

To emphasize the equal importance of employee wellness to the traditional three aims, policymakers should consider policies that incentivize employers for meeting objective employee wellness outcomes and penalize those that fail to make progress towards meeting those goals. Government policy change is likely to make the largest impact in creating change. Early evidence is suggesting that nurses that cared for COVID-19 patients and were exposed to shortages of personal protective equipment during the pandemic have lower occupational satisfaction ($p = .013$; $p = .039$, respectively) (Savitsky, 2021, p. 3). A policy change to support employee well-being would be a strong show of support from the government who largely failed healthcare workers during the COVID-19 pandemic by failing to supply personal protective equipment.

For Employers

The literature has shown promising effects from practicing mindfulness. If an employer seeks to gain the benefits of mindful employees, they must be willing to commit significant resources to achieve that goal. Every year, employers require healthcare workers to complete mandatory trainings; perhaps an equal portion of that training should be committed to employee well-being. Formal instruction in mindfulness could be provided via webinar, with links embedded in the content to connect interested employees to already available resources. Employers may choose to include mindfulness training as part of new employee onboarding. These steps show that the employer values employee wellness equally to the other three aims of healthcare. In the same way physical health is incentivized by employers, emotional and mental health should be incentivized. Perhaps financial incentives for attending mindfulness sessions or

tuition advancement for a weekend-long mindfulness retreat could be provided. Finally, employers need to advocate for their employees to have better access to mental and emotional health professionals, where evidence-based interventions can be taught one-on-one in a safe and supportive setting.

Nursing governance structures can also adapt to emphasize the Quadruple Aim. Committees frequently exist for evidence-based practice and the patient experience. Perhaps a new committee, for employee wellness, is created. Interested nurses can undergo extra training and become unit champions for mindfulness. They can assess unit-specific barriers to mindfulness practice and collaborate with other champions to improve employee well-being. Two major barriers identified by nurses in this program were not having enough time (n = 29, 30.2%) and forgetting to practice (n = 33, 34.4%). Frontline nurses may have novel ideas on how to create time for mindfulness practice and ways to integrate reminders to practice into day-to-day life.

One interesting implication for employers regards recruiting nurses to participate in mindfulness. As mentioned earlier, nurses in this survey most frequently reported hearing about mindfulness practice less than once per week but more than once per month. Yet, there were almost daily prompts, in the form of embedded links in a daily COVID-19 update email, from UVA Health during this period. It seems that most participants did not recall seeing them. This would suggest that employers need to consider novel invitation delivery methods to engage nurses. These methods will most definitely be unique to different hospital cultures and communication channels; this is where a unit champion may play a pivotal role.

Nurses in this survey repeatedly stated that a time of acute crisis was not the right time to learn these skills. One participant stated: “Work can be so stressful that at the times I need most

to be mindful, I have the least time and emotional availability to try to practice it." This chronic neglect of employee wellness was exacerbated by the COVID-19 pandemic; employers who failed to equip their employees with evidence-based coping strategies tried to quickly put things back together with resources that were never meant to be quick fixes. One nurse stated:

> Being an ICU nurse during the pandemic has been extremely difficult. While I do not mainly work in the [COVID ICU], I frequently float to help staff the unit. It's difficult to come to work when the unit/hospital is perpetually understaffed. Everyone has been asked to do more without any increase in pay or title change. During the spring [2020] HUCs and AA [unit secretaries] were furloughed, this left the nurses to play the role of both bedside nurse, charge nurse (charge nurses were forced to take full assignments), AA, HUC, etc. I constantly receive texts/emails asking if I can pick up extra shifts and we're now mandated to work overtime. I leave the hospital both physical and mentally exhausted. I find myself anxious about coming to work and have lost over 20lbs in the past 4 months. The nurses are simply burnt out. I often hear management and executives discuss the importance of "mindfulness"; however, it feels like a slap in the face to bedside nurses. I try to employ mindfulness practices in my life (walking the dog, listening to music, dancing in my kitchen), but I'm constantly berated with requests to pick up shifts and told how my colleagues are suffering. I feel guilty for saying no because I love my coworkers, but I'm realizing more and more the hospital doesn't actually care about me, and other bedside nurses. I am only a number and can easily be replaced with traveling nurses making three times what I make for the same job. I was recently told how 75+ ICU nurses have quit in the past several months and I'm not

> surprised. Unfortunately, hospital needs to employ more than "mindfulness" to keep the bedside nurses. The mental and physical health of nurses … are dismal.

As emphasized by this response, employers need to take responsibility for other determinants of employee pro-QOL, including the entire environment of care delivery. It is not enough to provide excellent mindfulness services and expect employees to cope with insurmountable expectations.

For Educators

Nursing educators have a role to play as well. While the body of evidence is sparse, it is suggested that nursing students experience BO as well. Ayaz-Alkaya (2018) reported an increase from 34.7% of students experiencing BO before their internship to 43.6% after ($p < 0.05$) (p. 21). If nearly half of new graduate nurses are entering the profession already burned out, what expectation can there be of improvement once they start full-time practice? Unfortunately, one in three new nurses will leave the nursing profession within the first 2 years (Cochran et al., 2020, p. 105).

In a survey of 155 publicly available course catalogs and websites of accredited nursing schools, Cochran et al. (2020) found that no nursing schools routinely screen their students for BO, and only 9% of schools offered resilience training of any kind in their required curriculum (p. 107). Acknowledging that gap, and creating change to address it, is essential to the long-term health of nurses. Nursing educators can model work-life balance, practice mindfulness skills personally, and train future nurses in how to integrate mindfulness into a high-stress role.

For Researchers

This program, unfortunately, was unable to answer the inquiry of whether or not an electronic delivery of a MBI alone could influence mindfulness or pro-QOL. It was also unable

to achieve a sample size sufficient for power analysis or introduce randomization. These struggles continue to plague the MBI literature.

One area for further research that emerged from this program is if formal training is required for successful mindfulness practice. As discussed previously, there are many different lay understandings of what mindfulness is, and thus, some people are practicing what they believe to be mindfulness but what may not be evidence-based. Perhaps a randomized study in which one group is allocated to a formal education followed by daily practice, compared to a group with only daily practice, could help provide more clarification on that phenomenon. Finally, non-significant studies need to be disseminated; they provide data that is essential for systematic reviews and meta-analyses to aggregate to understanding the true impact of MBI.

Another area for investigation is how to engage those not interested in MBI. It was observed in this program that there is low engagement with mindfulness. Who are these nurses? Are they burned out and thus unable to reach out and engage? Are they thriving, and thus find it unnecessary? Is there an intermediate, approachable step between disinterest and engagement in mindfulness? Are there alternate tools that achieve similar outcomes as MBI that are more agreeable to those disinterested in mindfulness? All of these questions will provide a more complete understanding of the mindfulness phenomenon, especially as it applies to ICU nurses.

Conclusion

The overall intention of this project was to improve pro-QOL for ICU nurses during a worldwide pandemic by evaluating a mindfulness tool available to UVA health employees. Because of low engagement in the program evaluation, a survey was disseminated to understand ICU nurses' opinions and experiences with mindfulness. It seems that mindfulness requires some level of formal training before an app like eMLife can become beneficial as a maintenance tool

for daily practice. Employers and educators need to consider how to integrate that formal training into established structures in order to produce and maintain resilient, mindful nurses that will be needed to restore health after this pandemic.

References

Alkhawaldeh, J. M. A., Soh, K. L., Mukhtar, F. B. M., Peng, O. C., & Anshasi, H. A. (2020). Stress management interventions for intensive and critical care nurses: A systematic review. *Nursing in Critical Care, 25*(2), 84-92.

Anderson, R., Mammen, K., Paul, P., Pletch, A., & Pulia, K. (2017). Using yoga nidra to improve stress in psychiatric nurses in a pilot study. *Journal of Alternative and Complementary Medicine, 23*(6), 494-495.

Ayaz-Alkaya, S., Yaman-Sözbir, Ş., & Bayrak-Kahraman, B. (2018). The effect of nursing internship program on burnout and professional commitment. *Nurse Education Today, 68*, 19-22.

Babanataj, R., Mazdarani, S., Hesamzadeh, A., Gorji, M. H., & Cherati, J. Y. (2019). Resilience training: Effects on occupational stress and resilience of critical care nurses. *International Journal of Nursing Practice, 25*(1), 1-6.

Baer, R. A. (n.d.). *Five Facet Mindfulness Questionnaire (FFMQ)*. Retrieved from http://ruthbaer.com/academics/FFMQ.pdf

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*(1), 27-45.

Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., Walsh, E., Duggan, D., & Williams, J. M. G. (2008). Construct validity of the Five Facet Mindfulness Questionnaire in meditating and nonmeditating samples. *Assessment, 15*(3), 329-342.

Bernstein, A. M., Kobs, A., Bar, J., Fay, S., Doyle, J., Golubic, M., & Roizen, M. F. (2015). Yoga for stress management among intensive care unit staff. *Alternative and Complementary Therapies, 21*(3), 111-115.

Best, C. (2019). Building resilience in contemporary nursing practice. *Practice Nursing, 30*(8), 400-404.

Bodenheimer, T., & Sinsky, C. (2014). From Triple to Quadruple Aim: Care of the patient requires care of the provider. *Annals of Family Medicine, 12*(6), 573-576.

Brown, S., Whichello, R., & Price, S. (2018). The impact of resiliency on nurse burnout: An integrative literature review. *MedSurg Nursing, 27*(6), 349-378.

Browning, S. G. (2019). Burnout in critical care nurses. *Critical Care Nursing Clinics of North America, 31*(4), 527-536.

Burton, A., Burgess, C., Dean, S., Koutsopoulou, G. Z., & Hugh-Jones, S. (2016). How effective are mindfulness-based interventions for reducing stress among healthcare professionals? A systematic review and meta-analysis. *Stress and Health, 33*(1), 3-13.

Cann, I., & Mullaney, D. M. (2019). Assessing for presenteeism and interest in "One Body" stress reduction fitness program in a healthcare setting. *Journal of Doctoral Nursing Practice, 12*(2), 225-231.

Carlson, L. E. (2018). Uptake of mindfulness-based interventions: A phenomenon of wealthy white western women? *Clinical Psychology Science and Practice, 25*(3), 1-5. https://doi.org/10.1111/cpsp.12258

Cochran, K. L., Moss, M., & Mealer, M. (2020). Prevalence of coping strategy training in nursing school curricula. *American Journal of Critical Care, 29*(2), 104-110.

Cohen-Katz, J., Wiley, S. D., Capuano, T., Baker, D. M., Deitrick, L., & Shapiro, S. (2005). The effects of mindfulness-based stress reduction on nurse stress and burnout: A qualitative and quantitative study, Part III. *Holistic Nursing Practice, 19*(2), 78-86.

Cohen-Katz, J., Wiley, S. D., Capuano, T., Baker, D. M., & Shapiro, S. (2004). The effects of mindfulness-based stress reduction on nurse stress and burnout: A qualitative and quantitative study, Part I. *Holistic Nursing Practice, 18*(6), 302-308.

Cohen-Katz, J., Wiley, S. D., Capuano, T., Baker, D. M., & Shapiro, S. (2005). The effects of mindfulness-based stress reduction on nurse stress and burnout: A qualitative and quantitative study, Part II. *Holistic Nursing Practice, 19*(1), 26-35.

Compassionate Care Initiative. (n.d.). *About*. Retrieved from https://cci.nursing.virginia.edu/about/

Contemplative Sciences Center. (n.d.). *Mission*. Retrieved from https://csc.virginia.edu/content/mission

Cutshall, S. M., Wentworth, L J.., Wahner-Roedler, D. L., Vincent, A., Schmidt, J. E., Loehrer, L. L., Cha, S. S., & Bauer, B. A. (2011). Evaluation of a biofeedback-assisted medication program as a stress management tool for hospital nurses: A pilot study. *Explore, 7*(2), 110-112.

Department of Health and Human Services. (2020). *Investigator responsibilities FAQs*. Retrieved from https://www.hhs.gov/ohrp/regulations-and-policy/guidance/faq/investigator-responsibilities/index.html

Dacar, S. L., Covell, C. L., & Papathanassoglou, E. (2019). Addressing moral distress in critical care nurses: A systemized literature review of intervention studies. *Connect: The World of Critical Care Nursing, 13*(2), 71-89.

Daigle, S., Talbot, F., & French, D. J. (2018). Mindfulness-based stress reduction training yields improvements in well-being and rates of perceived nursing errors among hospital nurses. *Journal of Advanced Nursing, 74*(10), 2427-2430.

Dos Santos, T. M., Kozasa, E. H., Carmagnani, I. S., Tanaka, L. H., Lacerda, S. S., & Noguiera-Martins, L. A. (2016). Positive effects of a stress reduction program based on mindfulness meditation in Brazilian nursing professionals: Qualitative and quantitative evaluation. *Explore, 12*(2), 90-99.

Duarte, J., & Pinto-Gouveia, J. (2016). Effectiveness of a mindfulness-based intervention on oncology nurses' burnout and compassion fatigue symptoms: A non-randomized study. *International Journal of Nursing Studies, 64*, 98-107.

Duarte, J., & Pinto-Gouveia, J. (2017). Mindfulness, self-compassion and psychological inflexibility mediate the effects of a mindfulness-based intervention in a sample of oncology nurses. *Journal of Contextual Behavioral Science, 6*, 125-133.

Duchemin, A-M., Steinburg, B. A., Marks, D. R., Vanover, K., & Klatt, M. (2016). A small randomized pilot study of a workplace mindfulness-based intervention for surgical intensive care unit personnel: Effects on salivary α-amylase levels. *Journal of Occupational and Environmental Medicine, 57*(4), 393-399.

Foureur, M., Besley, K., Burton, G., Yu, N., & Crisp, J. (2013). Enhancing the resilience of nurses and midwives: Pilot of a mindfulness-based program for increased health, sense of coherence and decreased depression, anxiety and stress. *Contemporary Nurse, 45*(1), 114-125.

Galantino, M. L., Baime, M., Maguire, M., Szapary, P. O., & Farrar, J. T. (2005). Short communication: Association of psychological and physiological measures of stress in health-care professionals during an 8-week mindfulness meditation program: Mindfulness in practice. *Stress and Health, 21*(4), 255-261.

Ganz, F. D. (2012). Tend and befriend in the intensive care unit. *Critical Care Nurse, 32*(3), 25-33.

Gauthier, T., Meyer, R. M. L., Grefe, D., & Gold, J. I. (2015). An on-the-job mindfulness-based intervention for pediatric ICU nurses: A pilot. *Journal of Pediatric Nursing, 30*(2), 402-409.

Ghawadra, S. F., Abdullah, K. L., Choo, W. Y., & Phang, C. K. (2019). Mindfulness-based stress reduction for psychological distress among nurses: A systematic review. *Journal of Clinical Nursing, 28*(21-22), 3747-3758.

Gracia Gozalo, R. M., Ferrer Tarres, J. M., Ayora Ayora, A., Alonso Herrero, M., Amutio Kareaga, A., & Ferrer Roca, R. (2019). Application of a mindfulness program among healthcare professionals in an intensive care unit: Effect on burnout, empathy and self-compassion. *Medicina Intensiva*, *43*(4), 207-216.

Heritage, B., Rees, C. S., & Hegney, D. G. (2018). The ProQOL-21: A revised version of the Professional Quality of Life (ProQOL) scale based on Rasch analysis. *PLoS ONE*, *13*(2), 1-20.

Hevezi, J. A. (2016). Evaluation of a meditation intervention to reduce the effects of stressors associated with compassion fatigue among nurses. *Journal of Holistic Nursing, 34*(4), 343-350.

Insurance Information Institute. (2018). *Facts and statistics: Workplace safety/workers comp*. Retrieved from https://www.iii.org/fact-statistic/facts-statistics-workplace-safety-workers-comp

Kelley, L. (2020). Burnout, compassion fatigue, and secondary trauma in nurses: Recognizing the occupational phenomenon and personal consequences of caregiving. *Critical Care Nurses Quarterly, 43*(1), 73-80.

Klatt, M., Steinberg, B., & Duchemin, A-M. (2015). Mindfulness in Motion (MIM): An onsite mindfulness based intervention (MBI) for chronically high stress work environments to increase resiliency and work engagement. *Journal of Visualized Experiments, 101*, 1-11.

Kravits, K., McAllister-Black, R., Grant, M., & Kirk, C. (2010). Self-care strategies for nurses: A psycho-educational intervention for stress reduction and the prevention of burnout. *Applied Nursing Research, 23*(3), 130-138.

Kurnat-Thoma, E., Ganger, M., Peterson, K., & Channell, L. (2017). Reducing annual hospital and registered nurse staff turnover—A 10-element onboarding program intervention. *SAGE Open Nursing, 3*, 1-13. https://doi.org/10.1177/2377960817697712

Lan, H. K., Rahmat, N., Subramanian, P., & Kar, P. C. (2014). The effects of mindfulness training program on reducing stress and promoting well-being among nurses in critical care nurses. *Australian Journal of Advanced Nursing, 31*(3), 22-31.

Lary, A., Borimnejad, L., & Mardani-Hamooleh, M. (2019). The impact of a stress management program on the stress response of nurses in neonatal intensive care units: A quasi-experimental study. *The Journal of Perinatal & Neonatal Nursing, 33*(2), 189-195.

Light, I., & Bincy, R. (2012). Effect of stress management interventions on job stress among nurses working in critical care units. *The Nursing Journal of India, 103*(6), 269-271.

Lin, L., He, G., Yan, J., Gu, C., & Xie, J. (2019). The effects of a modified mindfulness-based stress reduction program for nurses: A randomized controlled trial. *Workplace Health & Safety, 67*(3), 111-122.

Lomas, T., Cartwright, T., Edginton, T., & Ridge, D. (2015). A qualitative analysis of experiential challenges associated with meditation practice. *Mindfulness, 6,* 848-860.

Lustyk, M. K. B., Chawla, N., Nolan, R. S., & Marlatt, G. A. (2009). Mindfulness meditation research: Issues of participant screening, safety procedures, and researcher training. *Advances in Mind-Body Medicine, 24*(1), 20-30.

Mackenzie, C. S., Poulin, P. A., & Seidman-Carlson, R. (2006). A brief mindfulness-based stress reduction intervention for nurses and nurse aides. *Applied Nursing Research, 19*(2), 105-109.

Manias, E., Geddes, F., Watson, B., Jones, D., & Della, P. (2015). Perspectives of clinical handover process: A multi-site survey across different health professionals. *Journal of Clinical Nursing, 25*(1-2), 80-91.

McDonald, G., Jackson, D., Wilkes, L., & Vickers, M. H. (2012). A work-based educational intervention to support the development of personal resilience in nurses and midwives. *Nurse Education Today, 32*(4), 378-384.

Mealer, M., Burnham, E. L., Goode, C. J., Rothbaum, B., & Moss, M. (2009). The prevalence and impact of post traumatic stress disorder and burnout syndrome in nurses. *Depression and Anxiety, 26*(12), 1118-1126.

Mealer, M., Conrad, D., Evans, J., Jooste, K., Solyntjes, J., Rothbaum, B., & Moss, M. (2014). Feasibility and acceptability of a resilience training program for intensive care unit nurses. *American Journal of Critical Care, 23*(6), e97-e105.

Mealer, M., Jones, J., & Meek, P. (2017). Factors affecting resilience and development of posttraumatic stress disorder in critical care nurses. *American Journal of Critical Care, 26*(3), 184-192.

Medisauskaite, A., & Kamau, C. (2019). Reducing burnout and anxiety among doctors: Randomized controlled trial. *Psychiatry Research, 274*, 383-390.

Merriam-Webster. (n.d.). *Resilience*. Retrieved from https://www.merriam-webster.com/dictionary/resilience

Mindfulness Center. (n.d.). *About*. Retrieved from https://med.virginia.edu/mindfulness-center/about/

Moss, M., Good, V. S., Gozal, D., Kleinpell, R., & Sessler, C. N. (2016). An official Critical Care Societies Collaborative statement: Burnout syndrome in critical care health care professionals: A call for action. *American Journal of Critical Care, 25*(4), 368-376.

Nazari, F., Mirzamohamadi, M., & Yousefi, H. (2015). The effect of massage therapy on occupational stress of intensive care unit nurses. *Iranian Journal of Nursing and Midwifery Research, 20*(4), 508-515.

Nooryan, K., Gasparyan, K., Sharif, F., & Zoladl, M. (2012). Controlling anxiety in physicians and nurses working in intensive care units using emotional intelligence items as an anxiety management tool in Iran. *International Journal of General Medicine, 5*, 5-10.

NSI Nursing Solutions Inc. (2021). *2021 NSI national health retention & RN staffing report*. Retrieved from https://www.nsinursingsolutions.com/Documents/Library/NSI_National_Health_Care_Retention_Report.pdf

Onishi, K., Tsujikawa, M., Inoue, K., Yoshida, K., & Goto, S. (2016). The effect of complementary therapy for hospital nurses with high stress. *Asia-Pacific Journal of Oncology Nursing, 3*(3), 272-280

Polit, D. (2010). *Statistics and data analysis for nursing research*. Pearson.

Radford University. (n.d.). *Radford University McConnell library*. Retrieved from https://www.radford.edu/content/library.html

Rushton, C. H., Batcheller, J., Schroeder, K., & Donohue, P. (2015). Burnout and resilience among nurses practicing in high-intensity settings. *American Journal of Critical Care, 24*(5), 412-420.

Saedpanah, D., Salehi, S., & Moghaddam, L. F. (2016). The effect of emotion regulation training on occupational stress of critical care nurses. *Journal of Clinical and Diagnostic Research, 10*(12), 1-4.

Sallon, S., Katz-Eisner, D., Yaffe, H., & Bdolah-Abram, T. (2017). Caring for the caregivers: Results of an extended, five-component stress-reduction intervention for hospital staff. *Behavioral Medicine, 43*(1), 47-60.

Savitsky, B., Radomislensky, I., & Hendel, T. (2021). Nurses' occupational satisfaction during Covid-19 pandemic. *Applied Nursing Research, 59*, 1-6. https://doi.org/10.1016/j.apnr.2021.151416

Shapiro, D. H. (1992). Adverse effects of meditation: A preliminary investigation of long-term meditators. *International Journal of Psychosomatics, 39*(1-4), 62-67.

Shapiro, S. L., Astin, J. A., Bishop, S. R., & Cordova, M. (2005). Mindfulness-based stress reduction for health care professionals: Results from a randomized trial. *International Journal of Stress Management, 12*(2), 164-176.

Skinner, C. S., Tiro, J., & Champion, V. L. (2015). The health belief model. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior: Theory, research and practice* (pp. 75-94). Jossey-Bass.

Stamm, B. H. (2010). *The concise manual for the Professional Quality of Life Scale.* Retrieved from https://proqol.org/uploads/ProQOLManual.pdf

Steinburg, B. A., Klatt, M., & Duchemin, A-M. (2017). Feasibility of a mindfulness-based intervention for surgical intensive care unit personnel. *American Journal of Critical Care, 26*(1), 10-18.

Stimpfel, A. W., Sloane, D. M., & Aiken, L. H. (2012). The longer the shifts for hospital nurses, the higher the levels of burnout and patient dissatisfaction. *Health Affairs, 31*(11), 2501-2509.

Todaro-Franceschi, V. (2013). *Compassion fatigue and burnout in nursing: Enhancing professional quality of life*. Springer Publishing Company.

United States Centers for Medicare and Medicaid Services. (n.d.). *Value-based purchasing (VBP)*. Retrieved from https://www.healthcare.gov/glossary/value-based-purch

University of Virginia. (n.d.). *Facts and figures*. Retrieved from https://www.virginia.edu/facts#:~:text=Not%20including%20the%20College%20at,by%20U.S.%20News%20%26%20World%20Report

Unyte. (n.d.). *Subscriptions*. Retrieved from https://unyte.com/collections/subscriptions

UVA Health. (n.d.). *Facts & statistics*. Retrieved from https://uvahealth.com/about/facts-stats

UVA Health. (n.d.). *Mission, values, & goals*. Retrieved from https://uvahealth.com/about/mission

UVA Health. (n.d.). *SE4EOa*. Retrieved from http://www.uvagomagnet.com/structuralempowerment/SE04EOa.pdf

UVA Health. (n.d.). *SE6EO*. Retrieved from http://www.uvagomagnet.com/structuralempowerment/SE06EOREVISED.pdf

UVA Health Professional Nursing Staff Organization. (2018). *Annual report fiscal year 2018*. Retrieved from https://www.uvapnso.org/featured-public-content/pnso-annual-report-fiscal-2018-pdf/

Wang, S.-C., Wang, L.-Y., Shih, S.-M., Chang, S.-C., Fan, S.-Y., & Hu, W.-Y. (2017). The effects of mindfulness-based stress reduction on hospital nursing staff. *Applied Nursing Research, 38,* 124-128.

Watanabe, N., Horikoshi, M., Shinmei, I., Oe, Y., Narisawa, T., Kumachi, M., Matsouka, Y., Hamazaki, K., & Furukawa, T. A. (2019). Brief mindfulness-based stress management program for a better mental state in working populations—Happy Nurse Project: A randomized controlled trial. *Journal of Affective Disorders, 251,* 186-194.

Wright, E. M. (2018). Evaluation of a web-based holistic stress reduction pilot program among nurse-midwives. *Journal of Holistic Nursing, 36*(2), 159-169.

Wylde, C. M., Mahrer, N. E., Meyer, R. M. L., & Gold, J. I. (2017). Mindfulness for novice pediatric nurses: Smartphone application versus traditional intervention. *Journal of Pediatric Nursing, 36,* 205-212.

Appendix A

Radford University and University of Virginia Approvals of Original Program

RADFORD UNIVERSITY
Research Compliance Office

Institutional Animal Care and Use Committee / Institutional Review Board

September 3, 2020

TO:	Heidi Mock
RE:	DNP Final Project & IRB Determination
STUDY TITLE:	Mindful Moments in the ICU: Evaluating Asynchronous, Online Mindfulness Program in Critical Care Nurses
SUBMISSION TYPE:	IRB Determination
ACTION:	NHSR
DATE OF DETERMINATION:	September 3, 2020

The Radford University Institutional Review Board (IRB) concurs with the determination of the University of Virginia (UVA). The above-referenced project does not meet the definition of human subjects research covered by 45 CFR 46 and does not review by the IRB.

This determination applies only to the activities described in the documents submitted to the Radford University IRB and does not apply should any changed be made. If changes are considered and there are questions related to whether or not IRB review is needed, please reach out to the IRB for a determination.

If you have any questions, please contact the Research Compliance Office at 540.831.5290 or irb-iacuc@radford.edu. Please include your study title and reference number in all correspondence with this office.

Good luck with your project!

Anna Marie Lee

Anna Marie Lee, MHA, CPIA
Research Compliance Manager
Radford University
Irb-iacuc@radford.edu
https://www.radford.edu/content/research-compliance/home.html

cc: W. Downey, DNP

RE: Determination of Human Subjects Research form for consideration IRBHSR Tracking ID 22594

Mills, Karen C (kcm6t) <kcm6t@virginia.edu>

Tue 8/18/2020 5:14 PM

To: Mock, Heidi <htmock@RADFORD.EDU>

7 attachments (911 KB)

Recruitment and Enrollment Survey .docx; Mental Health Resources -email link informaton.docx; 22594 Determination Application Non-HSR 08-18-20 .doc; 22594 Determination Application Non-HSR 08-18-20 .pdf; Pre-Test.docx; Weekly Log.docx; Post-Test.docx;

Good afternoon,

Thanks for the revisions. They are perfect. I changed the name of that document from Enrollment Survey to Recruitment and Enrollment Survey. The IRBHSR QI COMMITTEE determined that this project as described does not meet the criteria for Human Subject Research. They determined that this project is Program Evaluation. The appropriate changes were made to the Application and the attached documents are considered final. No additional IRB submission/review is necessary for you to proceed with this project. Please refer to the attached IRB signed Determination (see PDF) for additional information.

We have on file all the necessary permissions from units where this project will take place. You should keep those permission with your project files.

Your project was assigned IRB Tracking Id # 22594 . This tracking ID has been added to the project documents attached.

Please keep this email and all attached documents with the project files.

Contact the IRB if there are changes to this project that may affect the initial non-human subject determination OR if you have questions or concerns.

Thanks,
Karen

Karen Coleman (Mimms) Mills, RN
Compliance Coordinator
IRB-HSR Board Member
Institutional Review Board-Health Sciences Research
434-964-7666
This number is Not a UVA number – dial full 7 digits OR if outside the 434 area code dial all 10 digits
OFFICE HOURS: M--F 08:00 - 12:00

Appendix B

Participant Flow

Appendix C

Enrollment Survey

Enrollment Survey

Survey Flow

Standard: Block 2 (1 Question)
Standard: Block 1 (9 Questions)
Block: Block 3 (1 Question)

EndSurvey: Advanced

Page Break

Start of Block: Block 2

Q11 Waldron College of Health and Human Sciences **Radford University Cover Letter for Internet Research**

You are invited to participate in a study, "Mindful Moments in the ICU," which is being conducted by Heidi Mock, a DNP Student at Radford University. The purpose of this study is to examine how mindfulness practice through eMLife impacts mindfulness and professional quality of life in ICU nurses. Your participation in the program will contribute to a better understanding of these practices through the use of an online mindfulness training program. Here is what you can expect while participating in this study:

- It will take about 5 minutes of your time to complete this questionnaire and enroll in the study.
- If eligible and interested, you will then be invited to complete pretesting. The pretesting should take no more than 15 minutes.
- After pretesting is completed, you will receive an email with instructions on how to access eMLife. You will enroll in eMLife using your UVA Health accounts.
- Starting the Sunday after you enroll, you will receive an email asking you to spend 15 minutes per day practicing mindfulness in eMLife, 6 days per week for 4 weeks. Just do the best you can. Some weeks, this goal may not be feasible but just do your best.
- Each week, you will receive a link to a survey where you will log your progress in eMLife. You will receive instructions on how to do that in each weekly email. Please

submit this survey even if you were not able to participate in eMLife at all during the week.

- At the end of the 4-week program, you will complete posttesting, which should take less than 15 minutes.
- You are free to contact the investigator at the phone number or email address listed below to discuss any of the surveys in this study.

There is minimal risk associated with participation in this study. Mindfulness, as practiced in this program, is considered safe for general use. Some people, though, have reported a period of worsened emotional state that they attribute to mindfulness practice. It is worth noting, however, that almost all of those people reported an overall improvement in mental health with continued mindfulness practice. If you find that mindfulness practice brings up uncomfortable feelings that you are unequipped to deal with, UVA Health has compiled a list of resources that you can access here. This document will also be emailed to you if you enroll in the study. Second, you will have to provide the researcher with your email address for communications during this study. Email addresses will be kept in password-protected accounts and deleted as soon as the study is completed. The researcher will work to protect your data to the extent permitted by technology. It is possible, although unlikely, that an unauthorized individual could gain access to your responses because you are responding online. This risk is similar to your everyday use of the internet. Your IP address cannot be identified by the researcher.

Your participation in this program is voluntary. You may decline to answer any question, and you have the right to withdraw from participation at any time without penalty. If you choose not to participate or decide to withdraw, there will be no impact on your access to eMLife. If you

choose not to participate in this study, but want more information about how to access eMLife, please contact Hoos Well. Your employment is in no way jeopardized by participation in, abstention from, or withdrawal from this program. Supervisors at UVA Health will not be made aware of your participation or have access to survey data collected. Only final data analysis and reported will be shared with UVA Health. If you have any questions, wish to withdraw, or wish to update your email address, please contact Heidi Mock at the contact information listed below. You may also request a hard copy of any of the surveys from the contact information below.

This study was approved by the Radford University Committee for the Review of Human Subjects Research. If you have questions or concerns about your rights as a study subject or have complaints about this study, you should contact Ben Caldwell, Institutional Official and Dean of the College of Graduate Studies and Research, bcaldwell13@radford.edu, 1.540.831.5724.

If you agree and consent to participate, please select the option "I consent to participate in this study" to take the initial survey. Otherwise, select "I do not consent to participate in this study," which will complete this invitation.

Thank you,

Heidi Mock

434-264-1923

htmock@radford.edu

○ I consent to participate in this study. (1)

○ I do not consent to participate in this study. (2)

Skip To: End of Survey If Waldron College of Health and Human Sciences Radford University Cover Letter for Internet Res... = I do not consent to participate in this study.

End of Block: Block 2

Start of Block: Block 1

Q2 Are you a Bedside registered nurse (RN) employed in any adult critical care capacity at UVA Health, including Medical ICU/Special Pathogens Unit, Nerancy Neuro ICU, Thoracic Cardiovascular ICU, Coronary Care Unit, Surgical Trauma ICU, SRO ICU float pool, or critical care float nurses?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Are you a Bedside registered nurse (RN) employed in any adult critical care capacity at UVA Healt... = No

Q3 Are you over 18 years old?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Are you over 18 years old? = No

Q4 Are you currently practicing mindfulness at least two (2) times per week most weeks?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Are you currently practicing mindfulness at least two (2) times per week most weeks? = Yes

Q5 Did you complete the 1% challenge through eMLife this spring?

- Yes (1)
- No (2)

Skip To: End of Survey If Did you complete the 1% challenge through eMLife this spring? = Yes

Q6 Are you a travel nurse?

- Yes (1)
- No (2)

Skip To: End of Survey If Are you a travel nurse? = Yes

Q7 Do you have daily access to the internet, either by cellphone or computer?

- Yes (1)
- No (2)

Skip To: End of Survey If Do you have daily access to the internet, either by cellphone or computer? = No

Q8 Are you intending to leave your position, either ICU nursing or UVA Health, within the next five weeks?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Are you intending to leave your position, either ICU nursing or UVA Health, within the next five... = Yes

Q9 Are you in your third trimester of pregnancy?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Are you in your third trimester of pregnancy? = Yes

Q10 Are you able and willing to fulfill the program requirements and complete the program?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Are you able and willing to fulfill the program requirements and complete the program? = No

End of Block: Block 1

Start of Block: Block 3

Q12 Please enter your preferred email address for study communications.

_____

End of Block: Block 3

Appendix D

Pretest

Pretest

Start of Block: Demographics Survey

Q6 Please choose a study identification (ID) number. You will enter this number on every form you submit in this program. This number will help keep your multiple surveys linked together without having to use your name or email address. Your study ID should be at least 4 numbers but can be longer. Choose a number that is meaningful to you and that you can remember. It may help to write it down somewhere in case you forget it. Some ideas for numbers could include an important date, like an anniversary or kid's birthday (04092005), or the phone number to your favorite restaurant (4342956092). Just make it unique and memorable.

_____

Q4 What unit do you work on right now?

- ○ MICU (1)
- ○ TCV ICU (2)
- ○ CCU (3)
- ○ STICU (4)
- ○ NNICU (5)
- ○ SRO (6)

Q1 How many years old are you?

_____

Q9 Which gender do you identify with?

- ○ Male (1)
- ○ Female (2)
- ○ Nonbinary/Gender non-conforming (3)
- ○ Other (4)

Q7 How many years have you been a nurse?

_____

Q8 How many years have you been an ICU nurse?

_____

Q10 How many years have you been working on your current unit?

_____

Q11 How many hours, on average, have you worked per week over the past month?

- ○ 12 hours or less (1)
- ○ 13-24 hours (2)
- ○ 25-36 hours (3)
- ○ 37-48 hours (4)
- ○ 48 hours or above (5)

End of Block: Demographics Survey

Start of Block: Five Facets Mindfulness Questionnaire

Q12 Please rate each of the following statements using the scale provided. Mark the number that best describes your own opinion of what it generally true for you over the past 30 days.

The Five Facets Mindfulness Questionnaire was written and created by Ruth Baer. This questionnaire is used with permission from her website, ruthbaer.com/academics/FFMQ.pdf

	1 = never or rarely true (1)	2 = rarely true (2)	3 = sometimes true (3)	4 = often true (4)	5 = very often or always true (5)
When I'm walking, I deliberately notice the sensations of my body moving. (1)	○	○	○	○	○
I'm good at finding words to describe my feelings. (2)	○	○	○	○	○
I criticize myself for having irrational or inappropriate emotions. (3)	○	○	○	○	○
I perceive my feelings and emotions without having to react to them. (4)	○	○	○	○	○
When I do things, my mind wanders off and I'm easily distracted. (5)	○	○	○	○	○
When I take a shower or bath, I stay alert to the sensations of water on my body. (6)	○	○	○	○	○
I can easily put my beliefs, opinions, and expectations into words. (7)	○	○	○	○	○

I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted. (8)	○	○	○	○	○
I watch my feelings without getting lost in them. (9)	○	○	○	○	○
I tell myself I shouldn't be feeling the way I'm feeling. (10)	○	○	○	○	○
I notice how foods and drinks affect my thoughts, bodily sensations, and emotions. (11)	○	○	○	○	○
It's hard for me to find the words to describe what I'm thinking. (12)	○	○	○	○	○
I'm easily distracted. (13)	○	○	○	○	○
I believe some of my thoughts are abnormal or bad and I shouldn't think that way. (14)	○	○	○	○	○
I pay attention to sensations, such as wind in my hair or sun on my face. (15)	○	○	○	○	○

I have trouble thinking of the right words to express how I feel about things. (16)	○	○	○	○	○
I make judgments about whether my thoughts are good or bad. (17)	○	○	○	○	○
I find it difficult to stay focused on what's happening in the present. (18)	○	○	○	○	○
When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it. (19)	○	○	○	○	○
I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing. (20)	○	○	○	○	○
In difficult situations, I can pause without immediately reacting. (21)	○	○	○	○	○

When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words. (22)	○	○	○	○	○
It seems I am "running on automatic" without much awareness of what I'm doing. (23)	○	○	○	○	○
When I have distressing thoughts or images, I feel calm soon after. (24)	○	○	○	○	○
I tell myself that I shouldn't be thinking the way I'm thinking. (25)	○	○	○	○	○
I notice the smells and aromas of things. (26)	○	○	○	○	○
Even when I'm feeling terribly upset, I can find a way to put it into words. (27)	○	○	○	○	○
I rush through activities without really being attentive to them. (28)	○	○	○	○	○

When I have distressing thoughts or images I am able to just notice them without reacting. (29)	○	○	○	○	○
I think some of my emotions are bad or inappropriate and I shouldn't feel them. (30)	○	○	○	○	○
I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow. (31)	○	○	○	○	○
My natural tendency is to put my experiences into words. (32)	○	○	○	○	○
When I have distressing thoughts or images, I just notice them and let them go. (33)	○	○	○	○	○
I do jobs or tasks automatically without being aware of what I'm doing. (34)	○	○	○	○	○

When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about. (35)	○	○	○	○	○
I pay attention to how my emotions affect my thoughts and behavior. (36)	○	○	○	○	○
I can usually describe how I feel at the moment in considerable detail. (37)	○	○	○	○	○
I find myself doing things without paying attention. (38)	○	○	○	○	○
I disapprove of myself when I have irrational ideas. (39)	○	○	○	○	○

End of Block: Five Facets Mindfulness Questionnaire

Start of Block: Professional Quality of Life Scale Version 5

Q3 When you help people you have direct contact with their lives. As you may have found, your compassion for those you help can affect you in positive and negative ways. Below are some questions about your experiences, both positive and negative, as a nurse. Consider each of the

following questions about you and your current work situation. Select the number that honestly reflects how frequently you experienced these things in the last 30 days.

The Professional Quality of Life Scale Version 5 was created by Beth Stamm and is used with

permission. Stamm, B. H. (2010). The concise ProQOL manual. Retrieved from https://proqol.org/uploads/ProQOLManual.pdf

	1=Never (1)	2 = Rarely (2)	3 = Sometimes (3)	4 = Often (4)	5 = Very Often (5)
I am happy. (1)	○	○	○	○	○
I am preoccupied with more than one person I help as a nurse. (2)	○	○	○	○	○
I get satisfaction from being able to help people as a nurse. (3)	○	○	○	○	○
I feel connected to others. (4)	○	○	○	○	○
I jump or am startled by unexpected sounds. (5)	○	○	○	○	○
I feel invigorated after working with those I help as a nurse. (6)	○	○	○	○	○
I find it difficult to separate my personal life from my life as a nurse. (7)	○	○	○	○	○
I am not as productive at work because I am losing sleep over traumatic experiences of a person I helped as a nurse. (8)	○	○	○	○	○

I think that I might have been affected by the traumatic stress of those I help as a nurse. (9)	○	○	○	○	○
I feel trapped by my job as a nurse. (10)	○	○	○	○	○
Because of my job as a nurse, I have felt "on edge" about various things. (11)	○	○	○	○	○
I like my work as a nurse. (12)	○	○	○	○	○
I feel depressed because of the traumatic experiences of the people I help as a nurse. (13)	○	○	○	○	○
I feel as though I am experiencing the trauma of someone I have helped as a nurse. (14)	○	○	○	○	○
I have beliefs that sustain me. (15)	○	○	○	○	○
I am pleased with how I am able to keep up with nursing techniques and protocols. (16)	○	○	○	○	○

I am the person I always wanted to be. (17)	○	○	○	○	○
My work makes me feel satisfied. (18)	○	○	○	○	○
I feel worn out because of my work as a nurse. (19)	○	○	○	○	○
I have happy thoughts and feelings about those I help as a nurse and how I could help them. (20)	○	○	○	○	○
I feel overwhelmed because my work load seems endless. (21)	○	○	○	○	○
I believe I can make a difference through my work. (22)	○	○	○	○	○
I avoid certain activities or situations because they remind me of frightening experiences of the people I help as a nurse. (23)	○	○	○	○	○
I am proud of what I can do to help as a nurse. (24)	○	○	○	○	○

As a result of nursing, I have intrusive, frightening thoughts. (25)	○	○	○	○	○
I feel "bogged down" by the system. (26)	○	○	○	○	○
I have thoughts that I am a "success" as a nurse. (27)	○	○	○	○	○
I can't recall important parts of my work with trauma victims. (28)	○	○	○	○	○
I am a very caring person. (29)	○	○	○	○	○
I am happy that I chose to do this work. (30)	○	○	○	○	○

End of Block: Professional Quality of Life Scale Version 5

Appendix E

Emails to Participants

Post-enrollment Email Script

Hello,

Thank you for enrolling in “Mindful Moments in the ICU”! If you haven’t yet completed the pretesting, please complete it here: **LINK**. There is just one more step necessary in order to get started—enrolling in eMLife, the mindfulness program we are using in this program. Instructions for enrolling in eMLife are attached. You can use eMLife on your phone, as an app, or on a computer, as a website.

Here is the link to the Hoos Well page about eMLife: https://hr.virginia.edu/emlife

Here is the link to register: https://vibe.emindful.com/signup/uva

Here’s what to expect for this program:

1. Every Sunday for five weeks, you will receive an e-mail from me that will include a link to a weekly Qualtrics survey. That survey is simply a place for you to enter your progress in eMLife. The instructions for how to do that are attached and will be attached in every weekly e-mail.
2. Throughout the week, attempt to spend 15 minutes per day in eMLife, 6 days per week. You can use the website, the app, or a combination of the two. Some days may be too busy for 15 minutes, and some weeks may be too busy for 6 days. Just do what you can, and submit what you were able to do, even if it was nothing.
3. The Sunday of the fifth week, you will receive an e-mail with two links. The first will be a place to submit your final documentation of activity in eMLife. The second will be an

opportunity to answer a few questions on your experience using eMLife and see if it has made any impact on your life.

As mentioned in the enrollment survey, there is a small risk that mindfulness practice can bring up unpleasant thoughts that can be upsetting to some people. If you experience this, please reach out for help. A list of resources is available here: https://docs.google.com/document/d/1YU_ymvqOGiTLJWMZDI1XsocyfGuehh2trqhhp8yBMrs/edit

Thank you for your willingness to participate in this program. If you have any questions throughout this process, please feel free to reach out to me.

Sincerely,

Heidi Mock, program lead

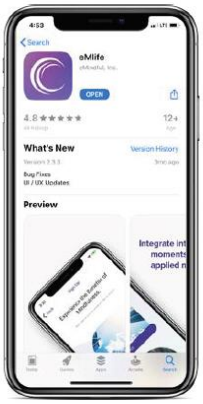
htmock@radford.edu

434-264-1923

Email Attachment 1: Enrolling in eMLife

A Step-by-Step Guide to Onboarding our Mobile App

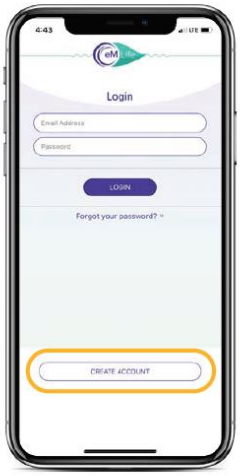
Step 1: Download the eM Life app in the App Store or on Google Play



Download on the App Store

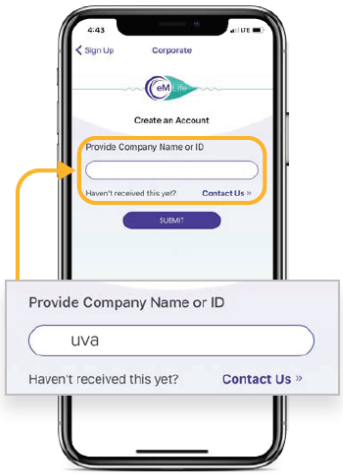
GET IT ON Google Play

Step 2: Click *Create Account.*



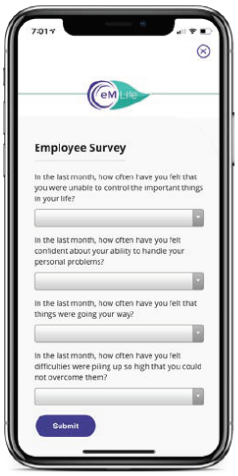
Step 3: Select the *Employee Account* option to proceed.

Step 4: Enter "uva" as your ID.



Step 5: Fill out your personal information.

Step 6: Complete the brief survey and enjoy eM Life.

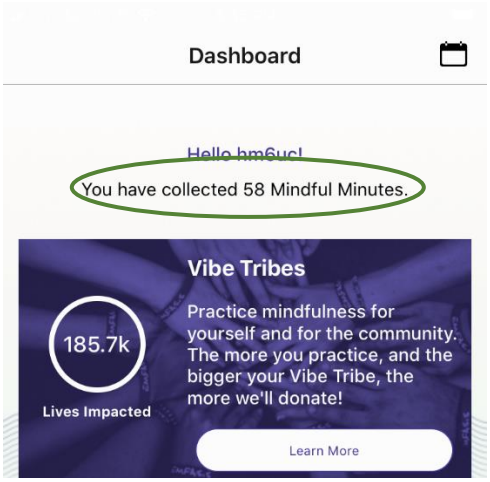


Email Attachment 2: Instructions for Submitting Weekly Logs

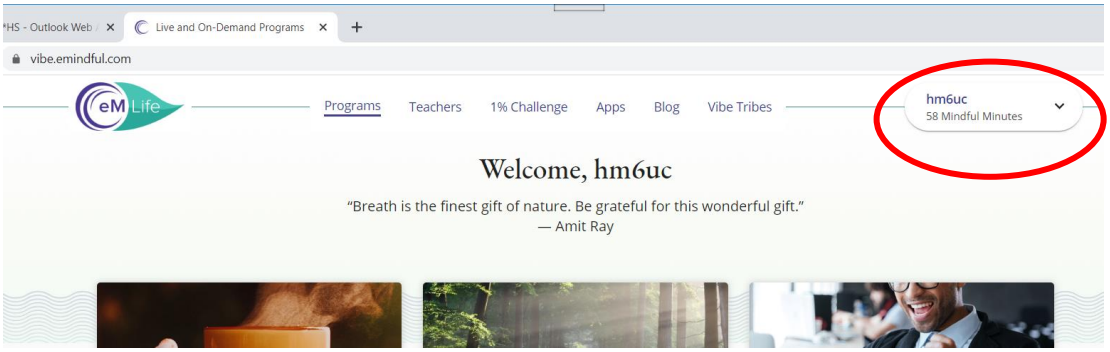
How to Submit Weekly Documentation

Follow the link in your email to the Qualtrics survey:

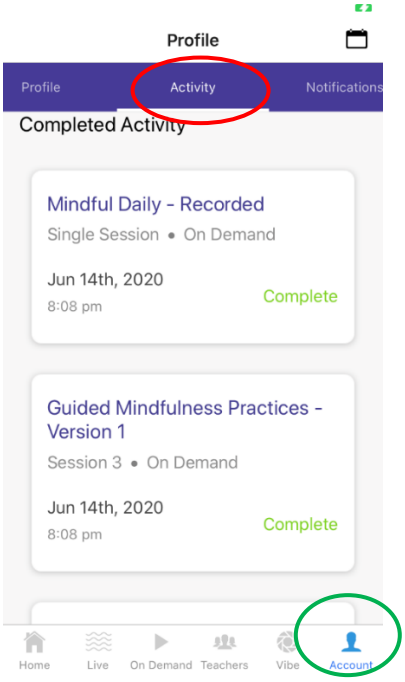
1. For question 1, just enter your study ID
2. For question 2, enter your total mindful minutes. Don't worry about subtracting last week's minutes from this week—I'll take care of it. Just enter the number as you see it every week. Where do you find your total mindful minutes?
    a. If you are logged into eMLife on a phone:
        i. Log in to the app
        ii. On the home screen, you'll find the total "Mindful Minutes," circled in green in the photo below



    b. If you are logged into eMLife from a computer:
        i. Log in to the eMLife website
        ii. Note your total "Mindful Minutes" listed on the home page. It is circled in red in the picture below.



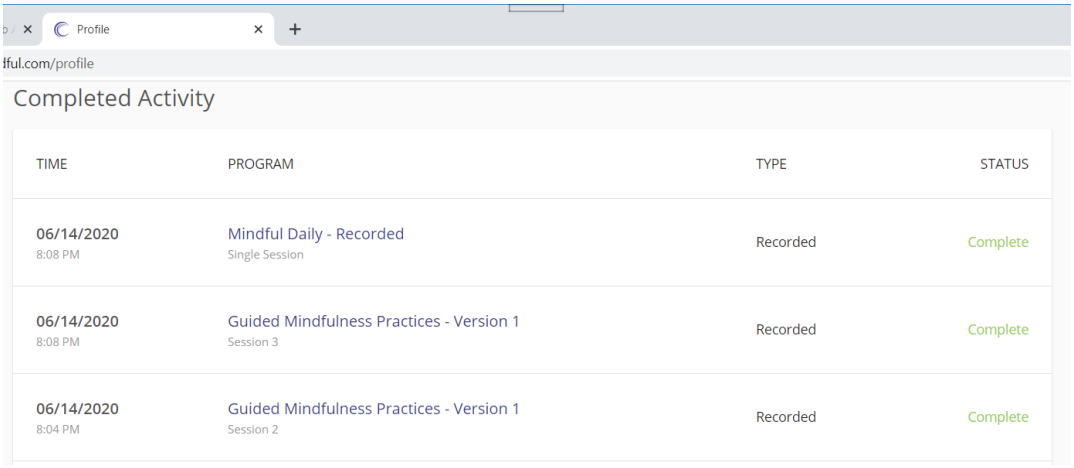
3. For question 3, you need to enter the total number of sessions you completed during the week. Where do you find that information?
    a. If you are logged into eMLife on your phone:
        i. Press on "Account" (circled in green in the photo below) and then click on "Activity" (circled in red in the photo below).
        ii. Once there, note how many sessions you have completed during the past week. The dates will be listed in your weekly email, but the week runs Sunday to Saturday.



b. If you are logged in to eMLife on your computer:

    i. Click on your “Mindful Minutes” and click on “Profile”

    ii. Once there, note how many sessions you have completed during the past week. The dates will be listed in your weekly email, but the week runs Sunday to Saturday.



Week 1 Sunday Email Script

Hello,

Welcome to Week 1! I hope this journey is helpful and beneficial to you. This week, try to spend 15 minutes in eMLife, six days out of the week. Follow the link below to practice submitting your weekly logs. You will need your study ID, total mindful minutes in eMLife, and the number of sessions completed (but this week there will likely be no mindful minutes or sessions). If you need assistance, please refer to the attached instructions.

Link:

Good luck and let me know if you have any questions!

Heidi Mock, program lead

htmock@radford.edu

434-264-1923

Weekly Log

Q1 Please enter your study ID

_____

Q2 What is your total mindful minutes?

_____

Q3 How many sessions did you complete this week?

_____

Tuesday Email Script

Hello,

Just a quick reminder to submit your progress reports to the link below. Remember that you need your study ID, total mindful minutes and sessions completed between *[insert dates here]*. If you need assistance, please refer to the attached instructions.

Link:

Let me know if you have any questions!

Heidi Mock, program lead

htmock@radford.edu

434-264-1923

Week 2 Sunday Email Script

Hello,

Congratulations on completing Week 1! Please submit your progress reports to the link below. You will need your study ID, total mindful minutes in eMLife, and number of sessions completed between {insert dates here}. If you need assistance, please refer to the attached instructions. For week 2, try to spend 15 minutes in eMLife, six days out of the week.

Link:

Good luck and let me know if you have any questions!

Heidi Mock, program lead

htmock@radford.edu

434-264-1923

Week 3 Sunday Email Script

Hello,

Congratulations on completing Week 2! Please submit your progress reports to the link below. You will need your study ID, total mindful minutes in eMLife, and number of sessions completed between {insert dates here}. If you need assistance, please refer to the attached instructions. For week 3, try to spend 15 minutes in eMLife, six days out of the week.

Link:

Good luck and let me know if you have any questions!

Heidi Mock, program lead

htmock@radford.edu

434-264-1923

Week 4 Sunday Email Script

Hello,

Congratulations on completing Week 3! Please submit your progress reports to the link below. You will need your study ID, total mindful minutes in eMLife, and number of sessions

completed between {insert dates here}. If you need assistance, please refer to the attached instructions. For week 4, try to spend 15 minutes in eMLife, six days out of the week.

Link:

Good luck and let me know if you have any questions!

Heidi Mock, program lead

htmock@radford.edu

434-264-1923

Week 5 Sunday Email Script

Hello,

Congratulations on completing “Mindful Moments in the ICU”! Please submit your progress reports to the link below. Remember that you need your study ID, total mindful minutes and sessions completed between *[insert dates here]*. If you need assistance, please refer to the attached instructions. Once you have submitted your final progress report, use the second link to complete the program and leave your feedback.

Link 1:

Link 2:

Thank you so much for your participation!

Heidi Mock, program lead

htmock@radford.edu

434-264-1923

Week 5 Tuesday Email Script

Hello,

Just a quick reminder to submit your progress reports to the link below. Remember that you need your study ID, total mindful minutes and sessions completed between *[insert dates here]*. If you need assistance, please refer to the attached instructions. Once you have submitted your final progress report, use the second link to complete the program and leave your feedback.

Link 1:

Link 2:

Thank you so much for your participation!

Heidi Mock, program lead

htmock@radford.edu

434-264-1923

Appendix F

Posttest

Posttest

Start of Block: Demographics Survey

Q6 Please enter your study ID

_____

Q11 How many hours, on average, have you worked per week over the past month?

- 12 hours or less (1)
- 13-24 hours (2)
- 25-36 hours (3)
- 37-48 hours (4)
- 48 hours or above (5)

Q13 Please share some feedback on your experience with eMLife

	Strongly disagree (11)	Somewhat disagree (12)	Neither agree nor disagree (13)	Somewhat agree (14)	Strongly agree (15)
eMLife improved my mental health (1)	○	○	○	○	○
eMLife was easy to use (2)	○	○	○	○	○
I enjoyed my time using eMLife (3)	○	○	○	○	○
The recommended time of 15 minutes per day six days per week was a reasonable amount of time to practice mindfulness (4)	○	○	○	○	○
eMLife improved my professional quality of life (5)	○	○	○	○	○
I will continue to use eMLife after this program (6)	○	○	○	○	○
I will recommend eMLife to my coworkers (7)	○	○	○	○	○

Q14 Please leave any other feedback regarding eMLife, mindfulness, or this program in the textbox below

_____

FFMQ, presented exactly the same as the pretest (see Appendix D)

ProQOL-5, presented exactly the same as the pretest (see Appendix D)

Appendix G

Radford University and University of Virginia Approvals of Modification

RADFORD UNIVERSITY

Research Compliance Office

Institutional Animal Care and Use Committee / Institutional Review Board

February 16, 2021

TO:	Heidi Mock
RE:	DNP Final Project & IRB Determination
STUDY TITLE:	Mindful Moments in the ICU: Evaluating Asynchronous, Online Mindfulness Program in Critical Care Nurses
SUBMISSION TYPE:	IRB Determination Amendment #1
ACTION:	NHSR
DATE OF DETERMINATION:	February 16, 2021

The Radford University Institutional Review Board (IRB) concurs with the determination of the University of Virginia (UVA). The above-referenced project amendment adding a survey and the addition of compensation via an alternative route does not meet the definition of human subjects research covered by 45 CFR 46 and does not review by the IRB.

This determination applies only to the activities described in the documents submitted to the Radford University IRB and does not apply should any changed be made. If changes are considered and there are questions related to whether or not IRB review is needed, please reach out to the IRB for a determination.

If you have any questions, please contact the Research Compliance Office at 540.831.5290 or irb-iacuc@radford.edu. Please include your study title and reference number in all correspondence with this office.

Good luck with your project!

Anna Marie Lee

Anna Marie Lee, MHA, CPIA
Research Compliance Manager
Radford University
Irb-iacuc@radford.edu
https://www.radford.edu/content/research-compliance/home.html

cc: W. Downey, DNP

RE: Modification to program protocol 22594

Mills, Karen C (kcm6t) <kcm6t@virginia.edu>
Wed 2/10/2021 9:46 PM
To: Mock, Heidi <htmock@RADFORD.EDU>

3 attachments (1 MB)
22594 Determination Application Non-HSR 02 04-21 Clean Copy.doc; 22594 KSAB Recruitment, Enrollment, and Survey.docx; 22594 Determination Application Non-HSR 02 04-21 signed version.pdf;

Good evening ,

The IRB-HSR is in receipt of your request to modify your current non -human research study in the following manner:

1. Add a survey
2. Addition of compensation via alternative route and tax information will not be collected. Program participants will provide their email address if they wish to be entered into a drawing where 4 addresses will be randomly selected to win an Amazon gift cards valued at $25.00.

The IRB-HSR QI Committee has determined that the modified project does not meet the criteria for Human Subject Research. No additional IRB submission/review is necessary for you to proceed with this project including the modification listed above. Please refer to the attached IRB signed Determination (see PDF) for additional information.

On file with this submission are:
1. the recruitment materials to be used which include a recruitment email to be sent to ICU managers to distribute to their staff. This email has a link to the survey. In addition, a flyer is also approved.
2. Survey questions are included in this recruitment document.

Please keep this email and all attached documents with the project files.

Contact the IRB if anything with this project changes such that the determination of non human subject research might be altered OR if you have questions or concerns.

Thanks,
Karen

Karen Mills, RN
Senior Compliance Analyst
IRB-HSR Board Member
Institutional Review Board-Health Sciences Research
434-964-7666
This number is Not a UVA number – dial full 7 digits OR if outside the 434 area code dial all 10 digits
OFFICE HOURS: M–F 08:30 - 4:30

Appendix H

Follow-up Survey

Recruitment Email Script:

Hello Nurses!

As part of my DNP Final Project, I am trying to understand ICU nurses' experience with mindfulness. As part of that exploration, I am sending out a quick 5-10 minute survey to gauge nurses' knowledge, skills, attitudes, and barriers to mindfulness practice. I hope to use this information both locally and nationally to help create mindfulness programs that are tailored to and beneficial for ICU nurses. As a thanks for participating, you can enter your email address into a drawing for one of four $25 Amazon gift cards.

Here's the link to the survey:

Thank you for your consideration, and please reach out if you have any questions!

Heidi Mock, project lead

Clinician III, Medical Intensive Care Unit at UVA

DNP/FNP Student at Radford University

Email: htmock@radford.edu

Call/text, anytime: 434-264-1923

Survey

Section 1: Informed Consent

You are invited to participate in a program evaluation project, “Mindful Moments in the ICU,” which is being conducted by Heidi Mock, a DNP Student at Radford University and RN in the Medical ICU at UVA. The purpose of this survey is to identify ICU nurses’ knowledge, skills, attitudes, and barriers towards mindfulness practice. Your participation in the program will contribute to a better understanding of mindfulness practice in ICU nurses and may help inform future mindfulness programs, both here at UVA and nationally.

This survey will take about 10 minutes of your time. After completing the survey, you will see a link to submit your email address for a chance to win one of four $25 Amazon gift cards. Your participation in this program is voluntary. You may decline to answer any question, and you may exit the survey at any time. You do not have to answer every question in order to be eligible for a gift card.

There is minimal risk associated with participation in this survey. The information you enter will not be linked to you in any way. The largest risk to you is if you choose to submit your email address for entry into the drawing for a gift card. Email addresses will be kept in password-protected accounts and deleted as soon as the study is completed. The program evaluator will work to protect your data to the extent permitted by technology. Submission of your email address is optional. It is possible, although unlikely, that an unauthorized individual could gain access to your responses because you are responding online. This risk is similar to your everyday use of the internet. Your IP address cannot be identified by the program team.

If you have any questions or wish to update or withdraw your email address, please contact Heidi Mock at the contact information listed below. You may also request a hard copy of the survey from the contact information below.

This project was approved by both the Radford University Committee for the Review of Human Subjects Research and the University of Virginia’s Institutional Review Board for Human Subjects Research. If you have questions or concerns about your rights as a program participant or have complaints about this program, you should contact Ben Caldwell, Institutional Official and Dean of the College of Graduate Studies and Research, bcaldwell13@radford.edu, 1.540.831.5724 or UVA’s IRB at irbhsr@virginia.edu (434) 924-2620.

If you agree and consent to participate, please select the option "I agree to participate in this survey” to take the survey. Otherwise, select "I do not agree to participate in this survey,” which will complete this invitation, or simply exit out of this survey.

Thank you,

Heidi Mock, program lead
Clinician III, Medical Intensive Care Unit at UVA

DNP/FNP Student at Radford University
434-264-1923
htmock@radford.edu

Section 2: Demographics/Eligibility Screening

(Note: in Qualtrics, the first question will be on its own page, with “no” rendering participants ineligible, and moving them directly to the final page of the survey)

1. Are you a registered nurse working in an adult ICU at UVA?
    a. Yes
    b. No
2. What unit do you work on right now?
    a. MICU
    b. TCV ICU
    c. CCU
    d. STICU
    e. NNICU
    f. SRO
    g. Other:
3. How many years old are you?
4. Which gender do you identify with?
    a. Male
    b. Female
    c. Nonbinary/Gender non-conforming
    d. Other
5. How many years have you been an ICU nurse?
6. How many years have you been working on your current unit?
7. How many hours, on average, have you worked per week over the past month?

Section 3: Survey

(Note: in Qualtrics, certain answers will reveal appropriate or hide non-applicable subsequent questions. For example, if a participant selects “yes” for question 3, they will be taken to question 4. If they select “no,” question 4 will be bypassed.)

Knowledge

1. Have you ever heard of mindfulness practice?
    a. Yes
    b. No
2. If yes, how frequently do you hear about practicing mindfulness?
    a. Daily
    b. More than once a week
    c. More than once a month
    d. A few times a year
3. Do you think you understand what mindfulness practice is?
    a. Yes
    b. No
4. If yes, can you write a one sentence description of what you consider mindfulness practice to be?

Skills

5. Have you had any formal training in mindfulness practice?
    a. Yes
    b. No
6. Do you think you have the skills and resources to practice mindfulness today if you wanted to?
    a. Yes
    b. No
7. Have you ever practiced mindfulness before?
    a. Yes
    b. No
8. Do you practice mindfulness now?
    a. Yes

b. No

Attitudes

9. If no, how interested are you to try mindfulness?
    a. 1- not willing at all
    b. 2- not very willing
    c. 3- neither willing nor unwilling
    d. 4- somewhat willing
    e. 5- very willing
10. If no, why do you not practice it? Select all that apply
    a. I did not like it
    b. I did not derive any benefit from it
    c. I did not find the benefits outweigh the time invested
    d. I do not know how to do it
    e. I do not have enough time
    f. I forget
    g. Other: fill in the blank
11. If yes, why do you practice it? Fill in the blank
12. What resources do you use to practice mindfulness?
    a. An app
        i. Which one?
    b. A podcast/audiotape
    c. Videos
    d. Memorized techniques
    e. Other: fill in the blank
13. If practicing, how much time do you devote to it?
    a. 15 minutes or less most days of the week
    b. More than 15 minutes most days of the week
    c. <15 a few days
    d. >15 a few days
    e. Irregular practice
    f. Other

Barriers

14. Would you like to practice mindfulness more?
    a. Yes: I think I could derive more benefit with more time
    b. No: I do not practice it and do not want to
    c. No: I practice, and the time I am investing is sufficient
    d. Other
15. What stops you from practicing mindfulness more?
    a. Not enough time
    b. I forget
    c. Stuck in a rut/struggle to find techniques
    d. The cost of resources
    e. Other

Final Thoughts

16. Please use this space to share any additional feedback, comments, or concerns you have about mindfulness practice, especially as it applies to you being an ICU nurse.

Section 4: Conclusion

Thank you for completing this survey about mindfulness. If you would like to be entered into the drawing for one of four $25 Amazon gift cards, follow this link and enter you email address.

Link: ____

2nd Survey:

Please enter your email address below. You will only be contacted if you win a gift card, which will be delivered to you electronically.

Appendix I

Heidi Mock Curriculum Vitae

Education

Radford University Radford, VA

FNP/DNP Student, January 2019-present (estimated graduation December 2022)

Radford University Radford, VA

Bachelor of Science in Nursing, May 2013, GPA 3.95/4.0

Elbert H. and Evelyn J. Waldron Presidential Scholarship Recipient 2009-2013

Clinical Experience

RN I *May 2021-present*

Post-Anesthesia Recovery Unit

Carilion Clinic, New River Valley Medical Center

Christiansburg, VA

- Staff nurse, assisting in the recovery of post-surgical patients from anesthesia

RN Clinician III *December 2015-May 2021*

Medical Intensive Care Unit

University of Virginia Health System

Charlottesville, VA

- Charge Nurse, 12-36 hours/wk, 2018-2021
- Preceptor, 2017-2021
    - Precepting new graduate and experienced RNs
- Falls Champion, 2017-2021
    - Attend monthly meetings and serve as unit resource and educator
- Skin Care Champion, 2017-2021
    - Maintain competencies in wound care and HAPU prevention, identification, and treatment
    - Serve as resource on unit
    - Monthly pressure ulcer prevalence rounds
- IV Medication Administration Work Group, November 2017-February 2018
    - Used LEAN methodology to evaluate current state and create new workflows and standard work
- IV Medication Administration Educator, September 2018-April 2019
    - Educated all critical care nurses on best practice for safe IV medication administration via three hour simulation-based class
- IV Medication Administration Champion, September 2018-2021
    - Weekly report processing, quality improvement, and staff education
- Special Pathogens Team 2017-2021

RN IV *September 2013- November 2015*
Cardiac Clinical Decisions Unit & Epilepsy Monitoring Unit
Carilion Clinic, Roanoke Memorial Hospital
Roanoke, VA
2015 Nursing Research Fellow

- Principle Investigator for research study titled "The Impact of Three Different Sleep Routines on Patients' Perception of Sleep Quality"
- Charge Nurse, 12-36 hours/week, 2014-2015
- GetWell Network Super User, 2014-2015
- Council Membership:
    - Nursing Research and Evidence Based Practice, 2013-2015
        - Dissemination subcommittee: peer-review submissions for WithinREACH, biannual research publication
    - Wounds, 2014-2015
        - Monthly HAPU prevalence surveys and unit educator

Certifications

- CCRN, April 2017-present
- Advanced Cardiac Life Support Provider, March 2014-present
- Pediatric Advanced Life Support Provider, June 2021-present
- Basic Life Support, March 2014-present

Memberships

- American Association of Critical Care Nurses, 2014- present
- Sigma Theta Tau International, 2015-present

Awards

Virginia Nurses Association's 40 Under 40 award winner, 2015

Publications and Presentations

"The Impact of Three Different Sleep Routines on Patients' Perception of Sleep Quality"

- Published in "WithinREACH," Carilion Clinic's biannual research journal, 2015
- Poster presentation at Carilion Clinic's Nursing Research Conference, 2015
- Poster presentation at 26th Annual Regional Cardiac Symposium by HeartNet of the Virginias, 2015

Volunteerism

Soddo Christian Hospital May 2019

- Served as ICU RN educator and consultant in a 6-bed ICU in rural Ethiopia

Camp Nurse May 2014

- Volunteered at Young Life's camp Rockbridge in Lexington, VA for a week of Young Life College camp, with over 400 campers and staff in attendance

Centro de Salud March 2015

- Volunteered as a nurse at the local medical clinic in Utila, Honduras